REFERENCE 35

Test America Analytical Testing Corporation, July 14, 2009, Amended Analytical Report for Black Butte Mine for samples received by the laboratory on 06/27/08, 38 pages.

Reference 35

TestAmerica
ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

July 14, 2009

Bryn Thoms
DEQ- EUGENE
1102 Lincoln, Suite 210
Eugene, OR 97401

RE: Black Butte Mine

Enclosed are the results of analyses for samples received by the laboratory on 06/25/08 07:15. The following list is a summary of the Work Orders contained in this report, generated on 07/14/09 09:27.

If you have any questions concerning this report, please feel free to contact me.

Amended Report: All results reported here supercede any previously reported results.

Work Order	Project	ProjectNumber
PRF0877	Black Butte Mine	07-63680-35754-34777

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
D1- Water	PRF0877-01	Water	06/23/08 10:05	06/25/08 07:15
D1- Sediment	PRF0877-02	Soil	06/23/08 10:05	06/25/08 07:15
DBG- Water	PRF0877-03	Water	06/23/08 10:35	06/25/08 07:15
DBG- Sediment	PRF0877-04	Soil	06/23/08 10:05	06/25/08 07:15
FBG- Water	PRF0877-05	Water	06/23/08 11:30	06/25/08 07:15
FBG- Sediment	PRF0877-06	Soil	06/23/08 11:30	06/25/08 07:15
TB1	PRF0877-07	Water	06/23/08 11:50	06/25/08 07:15
F1- Water	PRF0877-08	Water	06/23/08 12:00	06/25/08 07:15
F1- Sediment	PRF0877-09	Soil	06/23/08 12:00	06/25/08 07:15
F1D- Water	PRF0877-10	Water	06/23/08 12:05	06/25/08 07:15
F1D- Sediment	PRF0877-11	Soil	06/23/08 12:05	06/25/08 07:15
G1- Water	PRF0877-12	Water	06/23/08 13:15	06/25/08 07:15
G1- Sediment	PRF0877-13	Soil	06/23/08 13:15	06/25/08 07:15
G1D- Water	PRF0877-14	Water	06/23/08 13:40	06/25/08 07:15
G1D- Sediment	PRF0877-15	Soil	06/23/08 13:40	06/25/08 07:15
G1.5- Water	PRF0877-16	Water	06/23/08 14:20	06/25/08 07:15
G1.5- Sediment	PRF0877-17	Soil	06/23/08 14:20	06/25/08 07:15
BR1- Water	PRF0877-18	Water	06/23/08 15:15	06/25/08 07:15
BR1- Sediment	PRF0877-19	Soil	06/23/08 15:15	06/25/08 07:15
G2- Water	PRF0877-20	Water	06/23/08 15:55	06/25/08 07:15
G2- Sediment	PRF0877-21	Soil	06/23/08 15:55	06/25/08 07:15
C1- Water	PRF0877-22	Water	06/23/08 16:20	06/25/08 07:15
C1- Sediment	PRF0877-23	Soil	06/23/08 16:20	06/25/08 07:15

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Amended Report

Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Analytical Case Narrative

TestAmerica - Portland, OR

PRF0877

Amended report to reflect the reporting the mercury sediment data (EPA 7471A) to the method detection limit (MDL) at the request of the client.

Second amended report issued to reflect reporting of all mercury data to the MDL, at the request of the client.

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Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name: **Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number: 07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager: Bryn Thoms	07/14/09 09:27

Mercury per EPA Method 1631E

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-01 (D1- Water)			**Water**			**Sampled: 06/23/08 10:05**				
Mercury	EPA 1631 Mod.	**0.0100**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 09:54	
PRF0877-03 (DBG- Water)			**Water**			**Sampled: 06/23/08 10:35**				
Mercury	EPA 1631 Mod.	**0.00528**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 09:56	
PRF0877-05 (FBG- Water)			**Water**			**Sampled: 06/23/08 11:30**				
Mercury	EPA 1631 Mod.	**0.0449**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:05	
PRF0877-07 (TB1)			**Water**			**Sampled: 06/23/08 11:50**				
Mercury	EPA 1631 Mod.	ND	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:08	
PRF0877-08 (F1- Water)			**Water**			**Sampled: 06/23/08 12:00**				
Mercury	EPA 1631 Mod.	**25.6**	*0.169*	2.50	ug/l	500x	8060967	06/25/08 15:23	06/26/08 11:10	
PRF0877-10 (F1D- Water)			**Water**			**Sampled: 06/23/08 12:05**				
Mercury	EPA 1631 Mod.	**14.1**	*0.0676*	1.00	ug/l	200x	8060967	06/25/08 15:23	06/26/08 11:06	
PRF0877-12 (G1- Water)			**Water**			**Sampled: 06/23/08 13:15**				
Mercury	EPA 1631 Mod.	**0.00625**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:29	
PRF0877-14 (G1D- Water)			**Water**			**Sampled: 06/23/08 13:40**				
Mercury	EPA 1631 Mod.	**0.00596**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:31	
PRF0877-16 (G1.5- Water)			**Water**			**Sampled: 06/23/08 14:20**				
Mercury	EPA 1631 Mod.	**0.00553**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:34	
PRF0877-18 (BR1- Water)			**Water**			**Sampled: 06/23/08 15:15**				
Mercury	EPA 1631 Mod.	**0.000515**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:37	J
PRF0877-20 (G2- Water)			**Water**			**Sampled: 06/23/08 15:55**				
Mercury	EPA 1631 Mod.	**0.00633**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:39	

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Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Mercury per EPA Method 1631E

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-22 (C1- Water)		**Water**				**Sampled: 06/23/08 16:20**				
Mercury	EPA 1631 Mod.	**0.00109**	*0.000338*	0.00500	ug/l	1x	8060967	06/25/08 15:23	06/26/08 10:42	J

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Amended Report

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

Darrell Auvil, Project Manager

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DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Total Mercury per EPA Method 7471A

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-02 (D1- Sediment)		**Soil**				**Sampled: 06/23/08 10:05**				
Mercury	EPA 7471A	**49.4**	*0.992*	4.96	mg/kg dry	50x	8060944	06/25/08 10:37	06/25/08 18:09	
PRF0877-04 (DBG- Sediment)		**Soil**				**Sampled: 06/23/08 10:05**				
Mercury	EPA 7471A	**4.82**	*0.314*	1.57	mg/kg dry	10x	8060944	06/25/08 10:37	06/25/08 18:01	
PRF0877-06 (FBG- Sediment)		**Soil**				**Sampled: 06/23/08 11:30**				
Mercury	EPA 7471A	**2.20**	*0.0418*	0.209	mg/kg dry	2x	8060944	06/25/08 10:37	06/25/08 17:32	
PRF0877-09 (F1- Sediment)		**Soil**				**Sampled: 06/23/08 12:00**				
Mercury	EPA 7471A	**70.2**	*1.18*	5.92	mg/kg dry	50x	8060944	06/25/08 10:37	06/25/08 17:36	
PRF0877-11 (F1D- Sediment)		**Soil**				**Sampled: 06/23/08 12:05**				
Mercury	EPA 7471A	**173**	*2.95*	14.7	mg/kg dry	100x	8060944	06/25/08 10:37	06/25/08 17:43	
PRF0877-13 (G1- Sediment)		**Soil**				**Sampled: 06/23/08 13:15**				
Mercury	EPA 7471A	**0.337**	*0.0308*	0.154	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:46	
PRF0877-15 (G1D- Sediment)		**Soil**				**Sampled: 06/23/08 13:40**				
Mercury	EPA 7471A	**0.462**	*0.0220*	0.110	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:48	
PRF0877-17 (G1.5- Sediment)		**Soil**				**Sampled: 06/23/08 14:20**				
Mercury	EPA 7471A	**0.618**	*0.0277*	0.139	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:51	
PRF0877-19 (BR1- Sediment)		**Soil**				**Sampled: 06/23/08 15:15**				
Mercury	EPA 7471A	ND	*0.0188*	0.0941	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:53	
PRF0877-21 (G2- Sediment)		**Soil**				**Sampled: 06/23/08 15:55**				
Mercury	EPA 7471A	**0.706**	*0.0177*	0.0884	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:55	
PRF0877-23 (C1- Sediment)		**Soil**				**Sampled: 06/23/08 16:20**				
Mercury	EPA 7471A	ND	*0.0161*	0.0804	mg/kg dry	1x	8060944	06/25/08 10:37	06/25/08 17:59	

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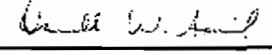

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Conventional Chemistry Parameters per Standard Methods

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-01 (D1- Water)		**Water**			**Sampled: 06/23/08 10:05**					
Total Suspended Solids	SM 2540D	**3.64**	—	3.64	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-03 (DBG- Water)		**Water**			**Sampled: 06/23/08 10:35**					
Total Suspended Solids	SM 2540D	**3.52**	—	3.52	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-05 (FBG- Water)		**Water**			**Sampled: 06/23/08 11:30**					
Total Suspended Solids	SM 2540D	**14.0**	—	3.51	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-08 (F1- Water)		**Water**			**Sampled: 06/23/08 12:00**					
Total Suspended Solids	SM 2540D	**116**	—	3.51	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-10 (F1D- Water)		**Water**			**Sampled: 06/23/08 12:05**					
Total Suspended Solids	SM 2540D	**47.3**	—	3.64	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-12 (G1- Water)		**Water**			**Sampled: 06/23/08 13:15**					
Total Suspended Solids	SM 2540D	**3.45**	—	3.45	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-14 (G1D- Water)		**Water**			**Sampled: 06/23/08 13:40**					
Total Suspended Solids	SM 2540D	**6.90**	—	3.45	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-16 (G1.5- Water)		**Water**			**Sampled: 06/23/08 14:20**					
Total Suspended Solids	SM 2540D	**3.45**	—	3.45	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-18 (BR1- Water)		**Water**			**Sampled: 06/23/08 15:15**					
Total Suspended Solids	SM 2540D	ND	—	3.45	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-20 (G2- Water)		**Water**			**Sampled: 06/23/08 15:55**					
Total Suspended Solids	SM 2540D	**3.39**	—	3.39	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	
PRF0877-22 (C1- Water)		**Water**			**Sampled: 06/23/08 16:20**					
Total Suspended Solids	SM 2540D	ND	—	3.51	mg/l	1x	8060954	06/25/08 11:50	06/25/08 16:55	

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Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-02 (D1- Sediment)		**Soil**				**Sampled: 06/23/08 10:05**				
% Solids	NCA SOP	62.1	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-04 (DBG- Sediment)		**Soil**				**Sampled: 06/23/08 10:05**				
% Solids	NCA SOP	56.4	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-06 (FBG- Sediment)		**Soil**				**Sampled: 06/23/08 11:30**				
% Solids	NCA SOP	63.3	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-09 (F1- Sediment)		**Soil**				**Sampled: 06/23/08 12:00**				
% Solids	NCA SOP	68.3	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-11 (F1D- Sediment)		**Soil**				**Sampled: 06/23/08 12:05**				
% Solids	NCA SOP	43.8	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-13 (G1- Sediment)		**Soil**				**Sampled: 06/23/08 13:15**				
% Solids	NCA SOP	56.6	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-15 (G1D- Sediment)		**Soil**				**Sampled: 06/23/08 13:40**				
% Solids	NCA SOP	56.7	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-17 (G1.5- Sediment)		**Soil**				**Sampled: 06/23/08 14:20**				
% Solids	NCA SOP	58.0	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-19 (BR1- Sediment)		**Soil**				**Sampled: 06/23/08 15:15**				
% Solids	NCA SOP	75.9	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-21 (G2- Sediment)		**Soil**				**Sampled: 06/23/08 15:55**				
% Solids	NCA SOP	67.8	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	
PRF0877-23 (C1- Sediment)		**Soil**				**Sampled: 06/23/08 16:20**				

TestAmerica Portland

Darrell Auvil, Project Manager

Amended Report

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1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0877-23 (C1- Sediment)		**Soil**				**Sampled: 06/23/08 16:20**				
% Solids	NCA SOP	**69.7**	—	0.0100	% by Weight	1x	8061121	06/30/08 11:41	06/30/08 11:41	

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Darrell Auvil, Project Manager

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Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Mercury per EPA Method 1631E - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8060967 **Water Preparation Method: EPA 1631**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8060967-BLK1)								Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	ND	0.000338	0.00500	ug/l	1x	--	--	--	--	--	--	06/26/08 09:28	
LCS (8060967-BS1)								Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0472	0.000338	0.00500	ug/l	1x	--	0.0500	94.3%	(85-115)	--	--	06/26/08 09:31	
LCS Dup (8060967-BSD1)								Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0461	0.000338	0.00500	ug/l	1x	--	0.0500	92.2%	(85-115)	2.23%	(20)	06/26/08 09:35	
Duplicate (8060967-DUP1)				QC Source: PRF0877-01				Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0106	0.000338	0.00500	ug/l	1x	0.0100	--	--	--	5.26%	(20)	06/26/08 09:38	
Matrix Spike (8060967-MS1)				QC Source: PRF0877-01				Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0578	0.000338	0.00500	ug/l	1x	0.0100	0.0500	95.5%	(71-125)	--	--	06/26/08 09:41	
Matrix Spike (8060967-MS2)				QC Source: PRF0877-20				Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0506	0.000338	0.00500	ug/l	1x	0.00633	0.0500	88.6%	(71-125)	--	--	06/26/08 09:47	
Matrix Spike Dup (8060967-MSD1)				QC Source: PRF0877-01				Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0595	0.000338	0.00500	ug/l	1x	0.0100	0.0500	99.0%	(71-125)	2.96%	(20)	06/26/08 09:44	
Matrix Spike Dup (8060967-MSD2)				QC Source: PRF0877-20				Extracted: 06/25/08 15:23						
Mercury	EPA 1631 Mod.	0.0508	0.000338	0.00500	ug/l	1x	0.00633	0.0500	88.9%	(71-125)	0.340%	(20)	06/26/08 09:50	

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ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Total Mercury per EPA Method 7471A - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8060944 **Soil Preparation Method: EPA 7471A**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8060944-BLK1)								Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	ND	0.0200	0.100	mg/kg wet	1x	--	--	--	--	--	--	06/25/08 16:52	
LCS (8060944-BS1)								Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	0.974	0.0200	0.100	mg/kg wet	1x	--	1.00	97.4%	(80-120)	--	--	06/25/08 16:54	
LCS Dup (8060944-BSD1)								Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	0.987	0.0200	0.100	mg/kg wet	1x	--	1.00	98.7%	(80-120)	1.37%	(20)	06/25/08 16:58	
Duplicate (8060944-DUP1)				QC Source: PRF0772-01				Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	ND	0.0170	0.0852	mg/kg dry	1x	ND	--	--	--	NR	(40)	06/25/08 17:02	
Matrix Spike (8060944-MS1)				QC Source: PRF0772-01				Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	0.783	0.0158	0.0789	mg/kg dry	1x	ND	0.789	99.2%	(75-125)	--	--	06/25/08 17:04	
Matrix Spike Dup (8060944-MSD1)				QC Source: PRF0772-01				Extracted: 06/25/08 10:37						
Mercury	EPA 7471A	0.798	0.0160	0.0798	mg/kg dry	1x	ND	0.798	99.9%	(75-125)	1.91%	(40)	06/25/08 17:07	

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Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Conventional Chemistry Parameters per Standard Methods - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8060954 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8060954-BLK1)								Extracted: 06/25/08 11:50						
Total Suspended Solids	SM 2540D	ND	—	10.0	mg/l	1x	—	—	—	—	—	—	06/25/08 16:55	
LCS (8060954-BS1)								Extracted: 06/25/08 11:50						
Total Suspended Solids	SM 2540D	50.0	—	10.0	mg/l	1x	—	50.0	100%	(80-120)	—	—	06/25/08 16:55	
Duplicate (8060954-DUP1)					QC Source: PRF0848-01			Extracted: 06/25/08 11:50						
Total Suspended Solids	SM 2540D	8.70	—	8.70	mg/l	1x	8.70	—	—	—	0.00%	(20)	06/25/08 16:55	

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Darrell W. Auvil

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Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Percent Dry Weight (Solids) per ASTM D2216-80 - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8061121 **Other dry Preparation Method: Dry Weight**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (8061121-DUP1)					QC Source: PRF0852-01				Extracted: 06/30/08 11:41					
% Solids	NCA SOP	72.0	—	0.0100	% by Weight	1x	69.7	—	—	—	3.25%	(20)	06/30/08 11:41	

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Darrell W. Auvil

Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	07-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:27

Notes and Definitions

Report Specific Notes:

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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Amended Report

July 14, 2009

Bryn Thoms
DEQ- EUGENE
1102 Lincoln, Suite 210
Eugene, OR 97401

RE: Black Butte Mine

Enclosed are the results of analyses for samples received by the laboratory on 06/27/08 07:30. The following list is a summary of the Work Orders contained in this report, generated on 07/14/09 09:30.

If you have any questions concerning this report, please feel free to contact me.

Amended Report: All results reported here supercede any previously reported results.

Work Order	Project	ProjectNumber
PRF0966	Black Butte Mine	09-63680-35754-34777

TestAmerica Portland

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W1- Water	PRF0966-01	Water	06/25/08 09:40	06/27/08 07:30
W1- Soil	PRF0966-02	Soil	06/25/08 09:40	06/27/08 07:30
TB2	PRF0966-03	Water	06/25/08 00:00	06/27/08 07:30
GO.5- Water	PRF0966-04	Water	06/25/08 10:20	06/27/08 07:30
GO.5- Soil	PRF0966-05	Soil	06/25/08 10:20	06/27/08 07:30
GBG- Water	PRF0966-06	Water	06/25/08 11:10	06/27/08 07:30
GBG- Soil	PRF0966-07	Soil	06/25/08 11:10	06/27/08 07:30
GBG2- Water	PRF0966-08	Water	06/25/08 11:50	06/27/08 07:30
GBG2- Soil	PRF0966-09	Soil	06/25/08 11:50	06/27/08 07:30
LR1- Water	PRF0966-10	Water	06/25/08 12:05	06/27/08 07:30
LR1- Soil	PRF0966-11	Soil	06/25/08 12:05	06/27/08 07:30
G1.4- Water	PRF0966-12	Water	06/25/08 13:35	06/27/08 07:30
G1.4- Soil	PRF0966-13	Soil	06/25/08 13:35	06/27/08 07:30
H1- Water	PRF0966-14	Water	06/25/08 14:15	06/27/08 07:30
H1- Soil	PRF0966-15	Soil	06/25/08 14:15	06/27/08 07:30
HUB1- Water	PRF0966-16	Water	06/25/08 14:40	06/27/08 07:30
A1- Water	PRF0966-17	Water	06/25/08 15:15	06/27/08 07:30
A1- Soil	PRF0966-18	Soil	06/25/08 15:15	06/27/08 07:30

TestAmerica Portland

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Analytical Case Narrative

TestAmerica - Portland, OR

PRF0966

Amended report to reflect reporting of all mercury data to the MDL, at the request of the client.

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Mercury per EPA Method 1631E

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0966-01 (W1- Water)			**Water**			**Sampled: 06/25/08 09:40**				
Mercury	EPA 1631 Mod.	**0.000671**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:01	J
PRF0966-03 (TB2)			**Water**			**Sampled: 06/25/08 00:00**				
Mercury	EPA 1631 Mod.	ND	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:14	
PRF0966-04 (GO.5- Water)			**Water**			**Sampled: 06/25/08 10:20**				
Mercury	EPA 1631 Mod.	**0.00619**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:17	
PRF0966-06 (GBG- Water)			**Water**			**Sampled: 06/25/08 11:10**				
Mercury	EPA 1631 Mod.	**0.00479**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:19	J
PRF0966-08 (GBG2- Water)			**Water**			**Sampled: 06/25/08 11:50**				
Mercury	EPA 1631 Mod.	**0.00169**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:22	J
PRF0966-10 (LR1- Water)			**Water**			**Sampled: 06/25/08 12:05**				
Mercury	EPA 1631 Mod.	**0.0112**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:25	
~~PRF0966-12 (G1.4- Water)~~			~~Water~~			~~Sampled: 06/25/08 13:35~~				
Mercury	EPA 1631 Mod.	**0.00489**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:27	J
PRF0966-14 (H1- Water)			**Water**			**Sampled: 06/25/08 14:15**				
Mercury	EPA 1631 Mod.	**0.00374**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:30	J
PRF0966-16 (HUB1- Water)			**Water**			**Sampled: 06/25/08 14:40**				
Mercury	EPA 1631 Mod.	**0.00187**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:33	J
PRF0966-17 (A1- Water)			**Water**			**Sampled: 06/25/08 15:15**				
Mercury	EPA 1631 Mod.	**0.00955**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:35	

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Amended Report

DEQ- EUGENE	Project Name: **Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number: 09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager: Bryn Thoms	07/14/09 09:30

Total Mercury per EPA Method 7471A

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0966-02 (W1- Soil)		**Soil**				**Sampled: 06/25/08 09:40**				
Mercury	EPA 7471A	ND	*0.0352*	0.176	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 14:46	
PRF0966-05 (GO.5- Soil)		**Soil**				**Sampled: 06/25/08 10:20**				
Mercury	EPA 7471A	**159**	*2.78*	13.9	mg/kg dry	100x	8070024	07/01/08 10:37	07/01/08 15:38	
PRF0966-07 (GBG- Soil)		**Soil**				**Sampled: 06/25/08 11:10**				
Mercury	EPA 7471A	**1.92**	*0.0348*	0.174	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:01	
PRF0966-09 (GBG2- Soil)		**Soil**				**Sampled: 06/25/08 11:50**				
Mercury	EPA 7471A	**0.0517**	*0.0276*	0.138	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:05	J
PRF0966-11 (LR1- Soil)		**Soil**				**Sampled: 06/25/08 12:05**				
Mercury	EPA 7471A	**0.201**	*0.0213*	0.106	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:13	
PRF0966-13 (G1.4- Soil)		**Soil**				**Sampled: 06/25/08 13:35**				
Mercury	EPA 7471A	**1.88**	*0.0210*	0.105	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:15	
PRF0966-15 (H1- Soil)		**Soil**				**Sampled: 06/25/08 14:15**				
Mercury	EPA 7471A	**0.0866**	*0.0238*	0.119	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:19	J
PRF0966-18 (A1- Soil)		**Soil**				**Sampled: 06/25/08 15:15**				
Mercury	EPA 7471A	ND	*0.0149*	0.0747	mg/kg dry	1x	8070024	07/01/08 10:37	07/01/08 15:21	

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Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Conventional Chemistry Parameters per Standard Methods

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0966-01 (W1- Water)		**Water**			**Sampled: 06/25/08 09:40**					
Total Suspended Solids	SM 2540D	**3.36**	—	3.36	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-04 (GO.5- Water)		**Water**			**Sampled: 06/25/08 10:20**					
Total Suspended Solids	SM 2540D	**3.46**	—	3.46	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-06 (GBG- Water)		**Water**			**Sampled: 06/25/08 11:10**					
Total Suspended Solids	SM 2540D	**3.42**	—	3.42	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-08 (GBG2- Water)		**Water**			**Sampled: 06/25/08 11:50**					
Total Suspended Solids	SM 2540D	**6.80**	—	3.40	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-10 (LR1- Water)		**Water**			**Sampled: 06/25/08 12:05**					
Total Suspended Solids	SM 2540D	**3.42**	—	3.42	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-12 (G1.4- Water)		**Water**			**Sampled: 06/25/08 13:35**					
Total Suspended Solids	SM 2540D	**3.42**	—	3.42	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-14 (H1- Water)		**Water**			**Sampled: 06/25/08 14:15**					
Total Suspended Solids	SM 2540D	**3.47**	—	3.47	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-16 (HUB1- Water)		**Water**			**Sampled: 06/25/08 14:40**					
Total Suspended Solids	SM 2540D	**3.53**	—	3.53	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	
PRF0966-17 (A1- Water)		**Water**			**Sampled: 06/25/08 15:15**					
Total Suspended Solids	SM 2540D	**13.9**	—	3.47	mg/l	1x	8061117	06/30/08 10:30	06/30/08 17:46	

TestAmerica Portland

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0966-02 (W1- Soil)		**Soil**			**Sampled: 06/25/08 09:40**					
% Solids	NCA SOP	46.6	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-05 (GO.5- Soil)		**Soil**			**Sampled: 06/25/08 10:20**					
% Solids	NCA SOP	71.4	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-07 (GBG- Soil)		**Soil**			**Sampled: 06/25/08 11:10**					
% Solids	NCA SOP	46.2	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-09 (GBG2- Soil)		**Soil**			**Sampled: 06/25/08 11:50**					
% Solids	NCA SOP	67.7	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-11 (LR1- Soil)		**Soil**			**Sampled: 06/25/08 12:05**					
% Solids	NCA SOP	62.8	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-13 (G1.4- Soil)		**Soil**			**Sampled: 06/25/08 13:35**					
% Solids	NCA SOP	62.5	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-15 (H1- Soil)		**Soil**			**Sampled: 06/25/08 14:15**					
% Solids	NCA SOP	75.5	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	
PRF0966-18 (A1- Soil)		**Soil**			**Sampled: 06/25/08 15:15**					
% Solids	NCA SOP	80.3	—	0.0100	% by Weight	1x	8070090	07/02/08 15:41	07/02/08 15:41	

TestAmerica Portland

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Mercury per EPA Method 1631E - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8061139 **Water Preparation Method: EPA 1631**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8061139-BLK1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	ND	0.000338	0.00500	ug/l	1x	--	--	--	--	--	--	07/01/08 09:33	
LCS (8061139-BS1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0488	0.000338	0.00500	ug/l	1x	--	0.0500	97.5%	(85-115)	--	--	07/01/08 09:35	
LCS Dup (8061139-BSD1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0491	0.000338	0.00500	ug/l	1x	--	0.0500	98.3%	(85-115)	0.735%	(20)	07/01/08 09:39	
Duplicate (8061139-DUP1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	ND	0.000338	0.00500	ug/l	1x	0.000671	--	--	--	--	(20)	07/01/08 09:42	
Matrix Spike (8061139-MS1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0473	0.000338	0.00500	ug/l	1x	0.000671	0.0500	93.3%	(71-125)	--	--	07/01/08 09:45	
Matrix Spike (8061139-MS2)				QC Source: PRF0966-17				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0573	0.000338	0.00500	ug/l	1x	0.00955	0.0500	95.4%	(71-125)	--	--	07/01/08 09:51	
Matrix Spike Dup (8061139-MSD1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0491	0.000338	0.00500	ug/l	1x	0.000671	0.0500	96.8%	(71-125)	3.64%	(20)	07/01/08 09:48	
Matrix Spike Dup (8061139-MSD2)				QC Source: PRF0966-17				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0576	0.000338	0.00500	ug/l	1x	0.00955	0.0500	96.0%	(71-125)	0.521%	(20)	07/01/08 09:55	

TestAmerica Portland

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

TestAmerica
ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Total Mercury per EPA Method 7471A - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8070024 **Soil Preparation Method: EPA 7471A**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8070024-BLK1)								Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	ND	0.0200	0.100	mg/kg wet	1x	--	--	--	--	--	--	07/01/08 13:58	
LCS (8070024-BS1)								Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	1.01	0.0200	0.100	mg/kg wet	1x	--	1.00	101%	(80-120)	--	--	07/01/08 14:00	
LCS Dup (8070024-BSD1)								Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	0.998	0.0200	0.100	mg/kg wet	1x	--	1.00	99.8%	(80-120)	1.29%	(20)	07/01/08 14:04	
Duplicate (8070024-DUP1)				QC Source: PRF0961-01				Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	ND	0.0534	0.267	mg/kg dry	1x	ND	--	--	--	NR	(40)	07/01/08 14:08	
Matrix Spike (8070024-MS1)				QC Source: PRF0961-01				Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	3.00	0.0575	0.287	mg/kg dry	1x	ND	2.87	104%	(75-125)	--	--	07/01/08 14:10	
Matrix Spike Dup (8070024-MSD1)				QC Source: PRF0961-01				Extracted: 07/01/08 10:37						
Mercury	EPA 7471A	3.38	0.0636	0.318	mg/kg dry	1x	ND	3.18	106%	(75-125)	11.8%	(40)	07/01/08 14:13	

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Darrell W. Auvil

Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Conventional Chemistry Parameters per Standard Methods - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8061117 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8061117-BLK1)								Extracted: 06/30/08 10:30						
Total Suspended Solids	SM 2540D	ND	--	10.0	mg/l	1x	--	--	--	--	--	--	06/30/08 17:46	
LCS (8061117-BS1)								Extracted: 06/30/08 10:30						
Total Suspended Solids	SM 2540D	50.0	--	10.0	mg/l	1x	--	50.0	100%	(80-120)	--	--	06/30/08 17:46	
Duplicate (8061117-DUP1)				QC Source: PRF0930-02				Extracted: 06/30/08 10:30						
Total Suspended Solids	SM 2540D	ND	--	2.00	mg/l	1x	ND	--	--	--	NR	(20)	06/30/08 17:46	

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Percent Dry Weight (Solids) per ASTM D2216-80 - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8070090 **Other dry Preparation Method: Dry Weight**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (8070090-DUP1)					**QC Source: PRG0072-01**								**Extracted: 07/02/08 15:41**	
% Solids	NCA SOP	91.4	—	0.0100	% by Weight	1x	79.5	—	—	—	13.9%	(20)	07/02/08 15:41	

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-35754-34777	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:30

Notes and Definitions

Report Specific Notes:

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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Amended Report

July 14, 2009

Bryn Thoms
DEQ- EUGENE
1102 Lincoln, Suite 210
Eugene, OR 97401

RE: Black Butte Mine

Enclosed are the results of analyses for samples received by the laboratory on 06/27/08 10:30. The following list is a summary of the Work Orders contained in this report, generated on 07/14/09 09:33.

If you have any questions concerning this report, please feel free to contact me.

Amended Report: All results reported here supercede any previously reported results.

Work Order	Project	ProjectNumber
PRF1004	Black Butte Mine	09-63680-38754

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
CED1	PRF1004-01	Water	06/26/08 11:00	06/27/08 10:30
CED1	PRF1004-02	Soil	06/26/08 11:00	06/27/08 10:30
J1	PRF1004-03	Water	06/26/08 11:25	06/27/08 10:30
J1	PRF1004-04	Soil	06/26/08 11:25	06/27/08 10:30
CFW1	PRF1004-05	Water	06/26/08 12:25	06/27/08 10:30
CFW1	PRF1004-06	Soil	06/26/08 12:25	06/27/08 10:30

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Analytical Case Narrative

TestAmerica - Portland, OR

PRF1004

Amended report to reflect reporting of mercury data to the MDL, at the request of the client.

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Mercury per EPA Method 1631E

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF1004-01 (CED1)		**Water**			**Sampled: 06/26/08 11:00**					
Mercury	EPA 1631 Mod.	ND	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:47	
PRF1004-03 (J1)		**Water**			**Sampled: 06/26/08 11:25**					
Mercury	EPA 1631 Mod.	**0.00116**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:50	J
PRF1004-05 (CFW1)		**Water**			**Sampled: 06/26/08 12:25**					
Mercury	EPA 1631 Mod.	**0.00249**	*0.000338*	0.00500	ug/l	1x	8061139	06/30/08 14:25	07/01/08 10:52	J

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Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Total Mercury per EPA Method 7471A

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF1004-02 (CED1)		**Soil**			**Sampled: 06/26/08 11:00**					
Mercury	EPA 7471A	ND	*0.0161*	0.0807	mg/kg dry	1x	8070072	07/02/08 13:09	07/02/08 14:33	
PRF1004-04 (J1)		**Soil**			**Sampled: 06/26/08 11:25**					
Mercury	EPA 7471A	**0.0181**	*0.0141*	0.0703	mg/kg dry	1x	8070072	07/02/08 13:09	07/02/08 14:35	J
PRF1004-06 (CFW1)		**Soil**			**Sampled: 06/26/08 12:25**					
Mercury	EPA 7471A	**0.302**	*0.0174*	0.0870	mg/kg dry	1x	8070072	07/02/08 13:09	07/02/08 14:37	

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Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Conventional Chemistry Parameters per Standard Methods

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF1004-01 (CED1)		**Water**				**Sampled: 06/26/08 11:00**				
Total Suspended Solids	SM 2540D	ND	—	9.26	mg/l	1x	8070027	07/01/08 11:00	07/01/08 17:48	
PRF1004-03 (J1)		**Water**				**Sampled: 06/26/08 11:25**				
Total Suspended Solids	SM 2540D	**8.13**	—	8.13	mg/l	1x	8070027	07/01/08 11:00	07/01/08 17:48	
PRF1004-05 (CFW1)		**Water**				**Sampled: 06/26/08 12:25**				
Total Suspended Solids	SM 2540D	ND	—	7.94	mg/l	1x	8070027	07/01/08 11:00	07/01/08 17:48	

TestAmerica Portland

Darrell W. Auvil

Amended Report

Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Percent Dry Weight (Solids) per ASTM D2216-80

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF1004-02 (CED1)		**Soil**			**Sampled: 06/26/08 11:00**					
% Solids	NCA SOP	66.3	—	0.0100	% by Weight	1x	8070113	07/03/08 09:09	07/03/08 09:09	
PRF1004-04 (J1)		**Soil**			**Sampled: 06/26/08 11:25**					
% Solids	NCA SOP	63.5	—	0.0100	% by Weight	1x	8070113	07/03/08 09:09	07/03/08 09:09	
PRF1004-06 (CFW1)		**Soil**			**Sampled: 06/26/08 12:25**					
% Solids	NCA SOP	57.8	—	0.0100	% by Weight	1x	8070113	07/03/08 09:09	07/03/08 09:09	

TestAmerica Portland

Darrell W. Auvil

Amended Report

Darrell Auvil, Project Manager

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Mercury per EPA Method 1631E - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8061139 **Water Preparation Method: EPA 1631**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8061139-BLK1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	ND	0.000338	0.00500	ug/l	1x	--	--	--	--	--	--	07/01/08 09:33	
LCS (8061139-BS1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0488	0.000338	0.00500	ug/l	1x	--	0.0500	97.5%	(85-115)	--	--	07/01/08 09:35	
LCS Dup (8061139-BSD1)								Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0491	0.000338	0.00500	ug/l	1x	--	0.0500	98.3%	(85-115)	0.735%	(20)	07/01/08 09:39	
Duplicate (8061139-DUP1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	ND	0.000338	0.00500	ug/l	1x	0.000671	--	--	--	--	(20)	07/01/08 09:42	
Matrix Spike (8061139-MS1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0473	0.000338	0.00500	ug/l	1x	0.000671	0.0500	93.3%	(71-125)	--	--	07/01/08 09:45	
Matrix Spike (8061139-MS2)				QC Source: PRF0966-17				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0573	0.000338	0.00500	ug/l	1x	0.00955	0.0500	95.4%	(71-125)	--	--	07/01/08 09:51	
Matrix Spike Dup (8061139-MSD1)				QC Source: PRF0966-01				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0491	0.000338	0.00500	ug/l	1x	0.000671	0.0500	96.8%	(71-125)	3.64%	(20)	07/01/08 09:48	
Matrix Spike Dup (8061139-MSD2)				QC Source: PRF0966-17				Extracted: 06/30/08 14:25						
Mercury	EPA 1631 Mod.	0.0576	0.000338	0.00500	ug/l	1x	0.00955	0.0500	96.0%	(71-125)	0.521%	(20)	07/01/08 09:55	

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Total Mercury per EPA Method 7471A - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8070072 **Soil Preparation Method: EPA 7471A**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8070072-BLK1)								Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	ND	0.0200	0.100	mg/kg wet	1x	--	--	--	--	--	--	07/02/08 13:57	
LCS (8070072-BS1)								Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	1.00	0.0200	0.100	mg/kg wet	1x	--	1.00	100%	(80-120)	--	--	07/02/08 13:59	
LCS Dup (8070072-BSD1)								Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	1.02	0.0200	0.100	mg/kg wet	1x	--	1.00	102%	(80-120)	1.40%	(20)	07/02/08 14:03	
Duplicate (8070072-DUP1)					QC Source: PRF0898-04			Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	7.10	0.241	1.21	mg/kg dry	1x	5.04	--	--	--	33.9%	(40)	07/02/08 14:07	
Matrix Spike (8070072-MS1)					QC Source: PRF0898-04			Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	20.8	0.236	1.18	mg/kg dry	1x	5.04	11.8	134%	(75-125)	--	--	07/02/08 14:10	M1
Matrix Spike Dup (8070072-MSD1)					QC Source: PRF0898-04			Extracted: 07/02/08 13:09						
Mercury	EPA 7471A	18.7	0.231	1.15	mg/kg dry	1x	5.04	11.5	118%	(75-125)	10.7%	(40)	07/02/08 14:14	

Amended Report

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Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Conventional Chemistry Parameters per Standard Methods - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8070027 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8070027-BLK1)								Extracted: 07/01/08 11:00						
Total Suspended Solids	SM 2540D	ND	—	10.0	mg/l	1x	—	—	—	—	—	—	07/01/08 17:48	
LCS (8070027-BS1)								Extracted: 07/01/08 11:00						
Total Suspended Solids	SM 2540D	40.0	—	10.0	mg/l	1x	—	50.0	80.0%	(80-120)	—	—	07/01/08 17:48	
Duplicate (8070027-DUP1)					QC Source: PRF1017-01			Extracted: 07/01/08 11:00						
Total Suspended Solids	SM 2540D	53.3	—	6.67	mg/l	1x	53.3	—	—	—	0.00%	(20)	07/01/08 17:48	

TestAmerica
ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Percent Dry Weight (Solids) per ASTM D2216-80 - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 8070113 **Other dry Preparation Method: Dry Weight**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (8070113-DUP1)					**QC Source: PRF0994-01**				**Extracted: 07/03/08 09:09**					
% Solids	NCA SOP	93.1	—	0.0100	% by Weight	1x	90.5	—	—	—	2.83%	(20)	07/03/08 09:09	

TestAmerica
ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Amended Report

DEQ- EUGENE	Project Name:	**Black Butte Mine**	
1102 Lincoln, Suite 210	Project Number:	09-63680-38754	Report Created:
Eugene, OR 97401	Project Manager:	Bryn Thoms	07/14/09 09:33

Notes and Definitions

Report Specific Notes:

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Darrell W. Auvil

Darrell Auvil, Project Manager

Amended Report

Photo 32 Tailings at area down slope of Old Ore Furnace.

Direction: Southwest Date: 8/29/2007 Time: 13:03 By: BC

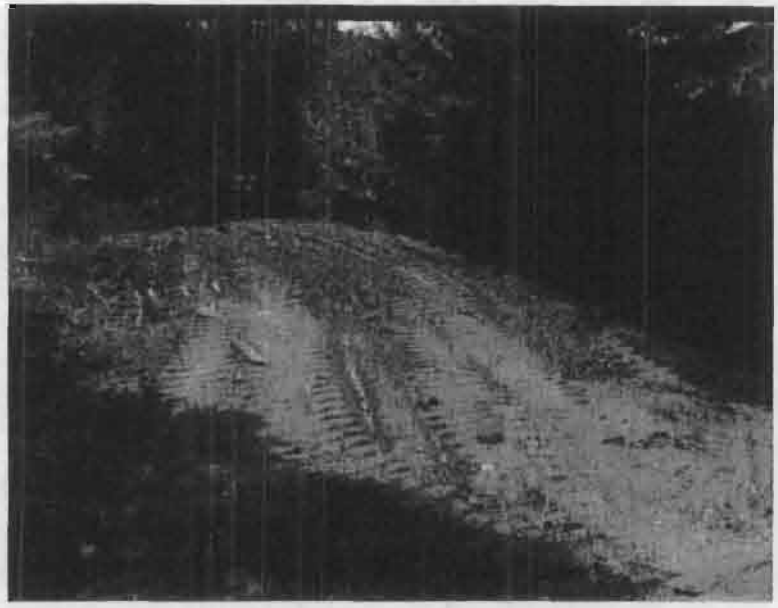


Photo 33 Capped tailings at area down slope of Old Ore Furnace.

Direction: Southwest Date: 8/30/2007 Time: 15:59 By: BC

Photo 34 Hauler taking capping materials to Old Ore Furnace for capping.

Direction: South Date: 8/30/2007 Time: 16:03 By: BC

Photo 35 Old Ore Furnace Area cap over debris near Old Ore Furnace.

Direction: West Date: 8/31/2007 Time: 9:35 By: BC

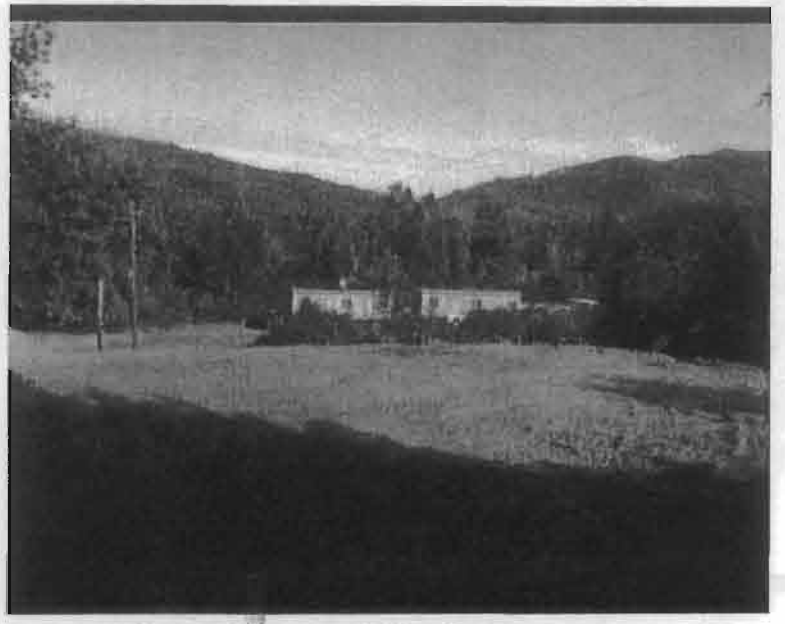


Photo 36 Command Post from Old Ore Furnace Area cap.

Direction: North *Date: 8/31/2007* *Time: 9:35* *By: BC*

Photo 37 Water tank from Old Ore Furnace Area cap.

Direction: East *Date: 8/31/2007* *Time: 9:35* *By: BC*

Photo 38 Old Ore Furnace.

Direction: Southwest *Date: 8/31/2007* *Time: 9:37* *By: BC*

Photo 39 Completed Old Ore Furnace Area cap over debris field near Old Ore Furnace.

Direction: West *Date: 8/31/2007* *Time: 16:32* *By: BC*

Photo 40 Completed Old Ore Furnace Area cap over debris field near Old Ore Furnace.

Direction: South *Date: 8/31/2007* *Time: 16:33* *By: BC*

Photo 41 Eastern finger of Old Ore Furnace Area cap.

Direction: Southeast *Date: 8/31/2007* *Time: 9:33* *By: BC*

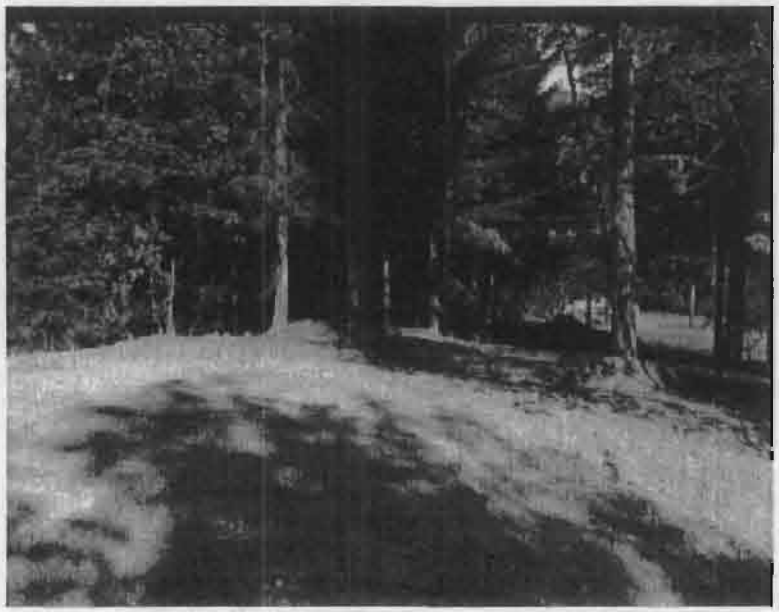


Photo 42 Old Ore Furnace Area cap looking west towards Old Ore Furnace.

Direction: East *Date: 8/31/2007* *Time: 9:33* *By: BC*

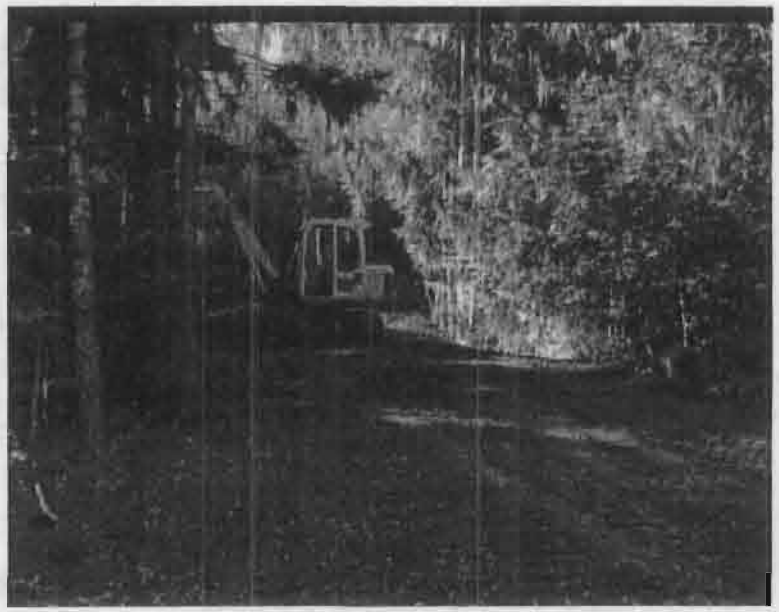


Photo 43 Eastern finger of Old Ore Furnace Area cap.

Direction: South *Date: 8/31/2007* *Time: 9:34* *By: BC*

BLACK BUTTE MINE
Cottage Grove, Oregon

Old Ore Furnace Area

Photo 44 Old Ore Furnace Area cap.

Direction: Southeast *Date: 9/3/2007* *Time:* *By: KP*

TDD Number: 06-04-0013
Photographed by: Bryan Ciecko (BC), Kathy Parker (KP)

Photo 45 Cap material pushed up to Old Ore Furnace structure.

Direction: East *Date: 9/4/2007* *Time:* *By: KP*

Photo 46 Piling tailings around buildings in New Furnace Area.

Direction: Northeast *Date: 8/24/2007* *Time:* *By: KP*

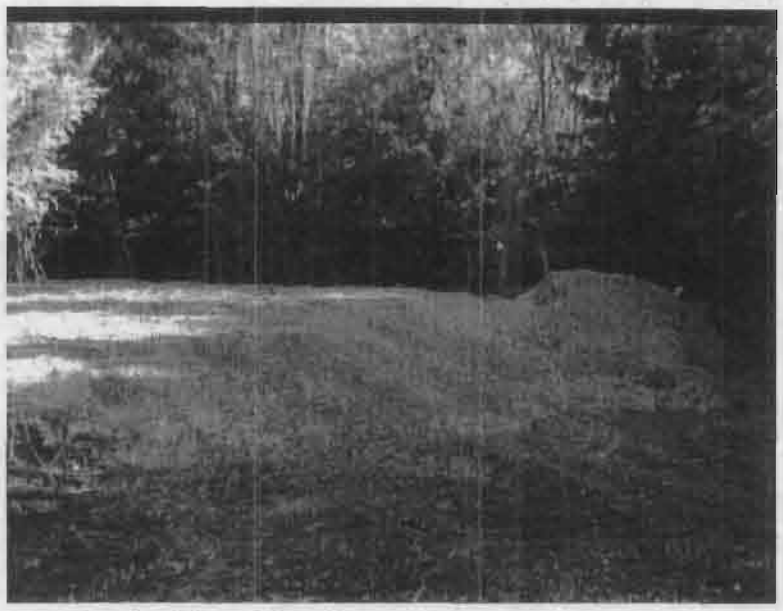


Photo 47 Partial cap in New Furnace Area.

Direction: North *Date: 8/24/2007* *Time:* *By: KP*

Photo 48 Smoothing cap around buildings in New Furnace Area.

Direction: East *Date: 8/27/2007* *Time:* *By: KP*

Photo 49 Smoothing cap around buildings in New Furnace Area.

Direction: East *Date: 8/27/2007* *Time:* *By: KP*

BLACK BUTTE MINE
Cottage Grove, Oregon

New Furnace Area

TDD Number: 06-04-0013
Photographed by: Bryan Ciecko (BC), Kathy Parker (KP)

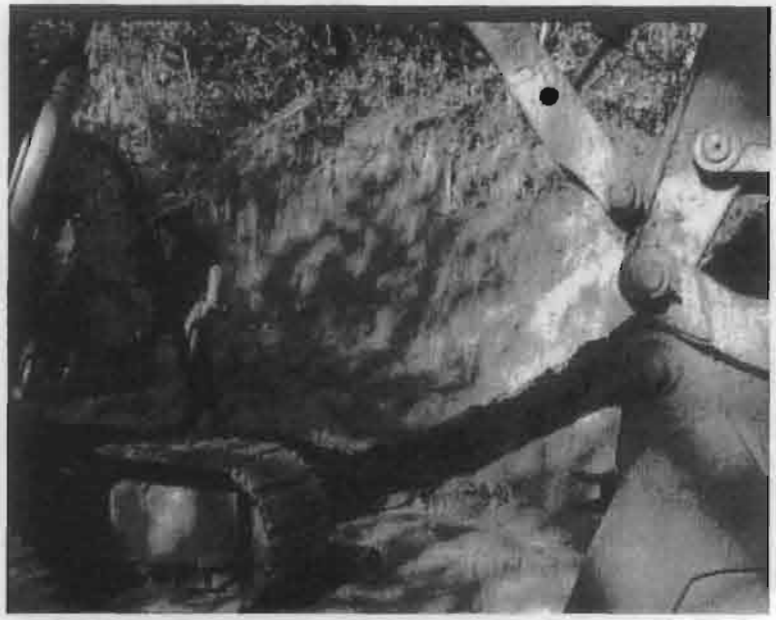


Photo 50 Soil removal area near New Furnace for final Main Tailings Pile slope cover.
Direction: East *Date: 8/31/2007* *Time: 16:28* *By: BC*

Photo 51 Soil removal area near New Furnace for final Main Tailings Pile slope cover.
Direction: East *Date: 8/31/2007* *Time: 16:28* *By: BC*

Photo 52 South of New Furnace - Slope reconstructon after fill material removal.
Direction: East *Date: 9/4/2007* *Time: 11:25* *By: BC*

Photo 53 South of New Furnace - Slope reconstructon after fill material removal.
Direction: East *Date: 9/4/2007* *Time: 11:31* *By: BC*

0088

Photo 54 Furnace Creek Near Old Ore Furnace, looking up stream.

Direction: South Date: 8/29/2007 Time: 12:59 By: BC

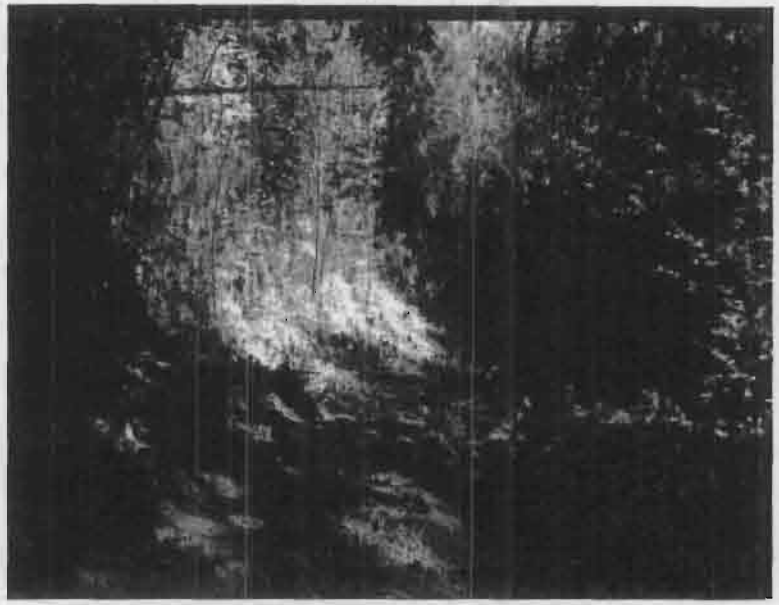


Photo 55 Furnace Creek Near Old Ore Furnace, looking up stream.

Direction: South Date: 8/29/2007 Time: 12:59 By: BC

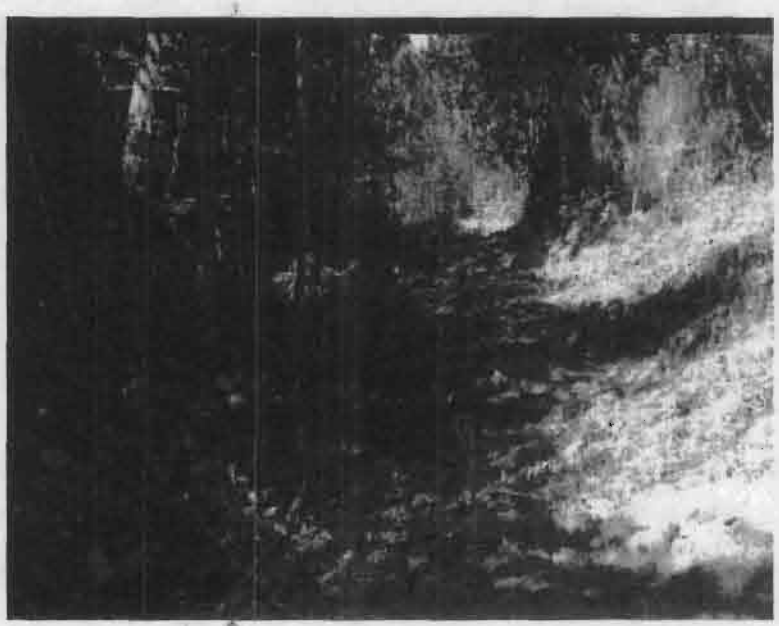


Photo 56 Furnace Creek up stream of Old Ore Furnace, looking down stream.

Direction: Northwest Date: 8/29/2007 Time: 13:00 By: BC

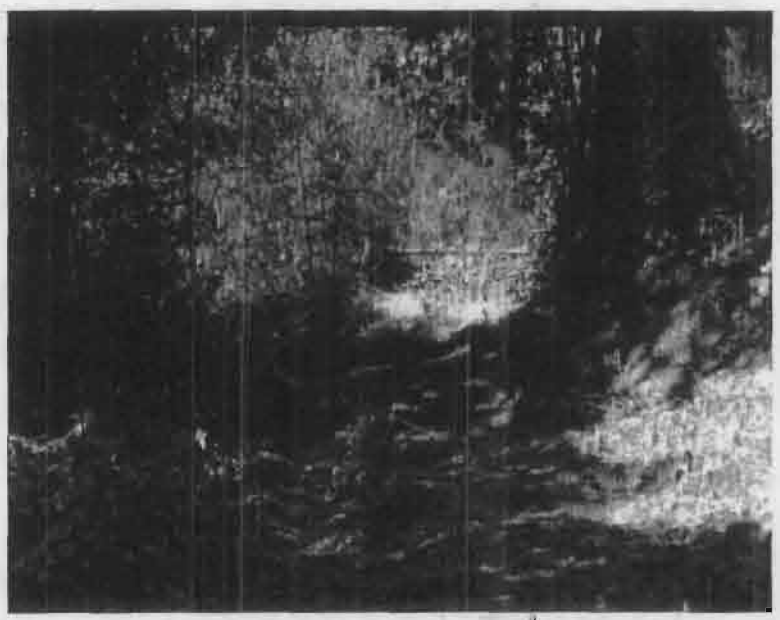


Photo 57 Furnace Creek up stream of Old Ore Furnace, looking down stream.

Direction: Northwest Date: 8/29/2007 Time: 13:00 By: BC

Photo 58 Bricks in Furnace Creek near Old Ore Furnace.

Direction: Down *Date: 8/29/2007* *Time: 13:01* *By: BC*

Photo 60 Furnace Creek test hole to determine depth of contamination. Showing ash layer high in mercury.

Direction: Northwest *Date: 8/29/2007* *Time:* *By: KP*

Photo 59 Brush clearing in furnace creek below 'son of the biting area'.

Direction: Southwest *Date: 8/29/2007* *Time: 13:05* *By: BC*

Photo 61 EPA OSC Parker walking up unimproved mine road.

Direction: South *Date: 8/30/2007* *Time: 15:58* *By: BC*

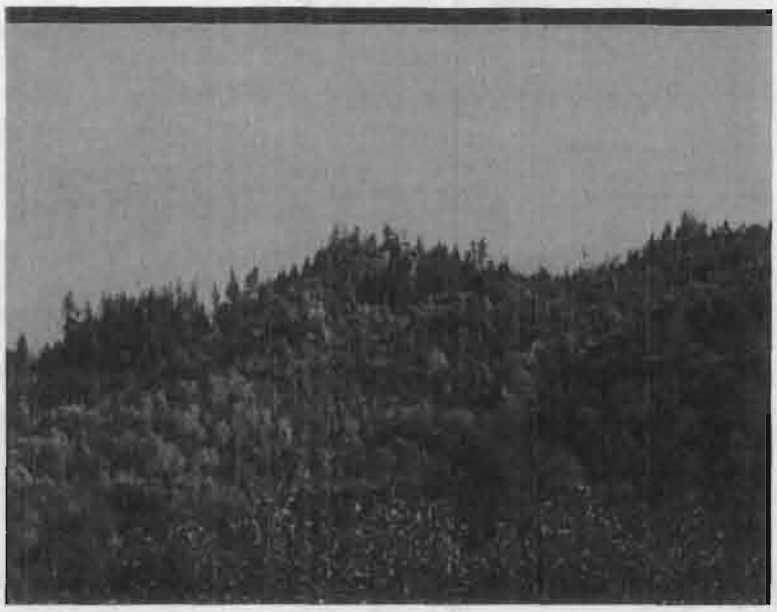


Photo 62 Top of Black Butte - Glory Hole.

Direction: Southeast *Date: 8/30/2007* *Time: 16:04* *By: BC*

Photo 63 Caterpillar shaping repository.

Direction: Northeast *Date: 8/31/2007* *Time: 9:19* *By: BC*

Photo 64 Representative of Oregon Governer's Office, Representative of ODEQ, OSC, Television Reporter.

Direction: South *Date: 8/30/2007* *Time:* *By: KP*

Photo 65 Television Crew, OSC Parker.

Direction: Northwest *Date: 8/30/2007* *Time:* *By: KP*

Photo 66 New gate installed at entrance to site.

Direction: East *Date: 8/31/2007* *Time:* *By: KP*

Photo 67 Repository.

Direction: North *Date: 9/4/2007* *Time:* *By: KP*

Photo 68 Main Tailing Pile - West slope tailings stockpile.

Direction: East *Date: 8/30/2007* *Time: 16:04* *By: BC*

Appendix B

Action Memorandum, Post Removal Site Controls Document, Community Relations Documents

ENVIRONMENTAL Fact Sheet

EPA **Black Butte Mine, Lane County, Oregon**

U.S. Environmental Protection Agency, Region 10 August 2007

Black Butte Mine to be cleaned up

Beginning this August, the U.S. Environmental Protection Agency (EPA), in partnership with the Oregon Department of Environmental Quality (DEQ), will begin a cleanup of the Black Butte Mine in southern Lane County, Oregon. The cleanup is expected to take about six weeks to complete. Black Butte Mine is an abandoned mercury mine near Dennis and Furnace Creeks. These are both tributaries to Garoutte Creek, which run into the Cottage Grove Reservoir which in turn drains into the Coast Fork of the Willamette River.

The cleanup will involve excavating, consolidating and stabilizing more than an estimated 40,000 cubic yards of contaminated waste material. This material includes tailings waste rock, mill waste, and sediments from private lands on the north edge of the site. Exposed mine tailings and nearby soils are contaminated with elevated levels of mercury, arsenic and other metals.

EPA cleanup plans call for excavating and moving the tailings along the mine's creek banks, and highly contaminated areas ("hotspots"), to a safe on-site repository away from the creeks. A protective layer of clean soil will cover these contaminated materials. While the cleanup work takes place, methods designed to prevent or reduce erosion will be carried out to prevent contaminated soil from moving off site into the nearby creek waters.

After the waste material is moved, EPA will re-slope the site, and replant disturbed areas. When finished, clean soils where the bank excavation took place will be seeded to further reduce potential movement of tailings into nearby creeks and downstream waterways. Long-term monitoring of the site is expected to be done by DEQ.

The goal of the cleanup is to prevent people from coming into contact with contaminated soils and sediments, and to reduce the migration of mercury contaminated tailings to the Cottage Grove, Oregon Reservoir.

EPA and the Oregon Department of Environmental Quality examine a tailings pile before beginning cleanup at Black Butte Mine site.

EPA will post more information about the cleanup on its website as soon as it becomes available. Visit http://www.epa.gov/region10/. Click on Index A-Z, then click on B for Black Butte Mine.

Site History

The Black Butte Mine operated between the 1890s and 1960s and was the fourth largest producer of mercury in Oregon. Waste rock, mill waste, and tailings remain on site as a byproduct of processing the ore. Contaminants from mining activities include mercury and arsenic. Since the mine closed in 1969, several individuals and companies have owned the property but did no mining.

(continued on back)

U.S. Environmental Protection Agency
1200 Sixth Avenue, ETPA-081
Seattle, Washington 98101-1128

Black Butte Mine
Cottage Grove, Oregon
August 2007

Site History *continued*

In 1996, DEQ's study, called a "Preliminary Assessment," identified possible public health and environmental threats related to contamination from this mine. In 2005, EPA did a removal assessment to study the contamination and found elevated levels of mercury and arsenic in mine tailings and soil.

About Mercury

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Exposure to high levels of mercury may damage the brain, kidneys, and developing fetus.

Mercury can be found in the air, water and soil. Mercury enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants. It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity. For more information about possible health effects from Mercury exposure, go to the Agency for Toxic Substances and Diseases Registry (ATSDR) Web page: *http://www.atsdr.cdc.gov/tfacts46.html*.

For More Information:

On the internet:
www.epaosc.net/BlackButteMineRemoval

Kathy Parker
EPA On-Scene Coordinator
206-553-0062 or toll free: 800-424-4372
parker.kathy@epa.gov

Judy Smith
EPA Community Involvement Coordinator
503-326-6994
smith.judy@epa.gov

Information Repository

To view information about this project, please visit:

Cottage Grove Public Library
40 South 6th
Cottage Grove, OR 97424
541-942-3828

If you are not on the Black Butte Mine mailing list and would like to be, please contact Judy Smith.

If you need materials in an alternative format, please contact Judy Smith. TTY users, please call the Federal Relay Service at 800-877-8339 and give the operator Judy Smith's number.

Oregon
Theodore Kulongoski, Governor

Department of Environmental Quality
Western Region Eugene Office
1102 Lincoln Street, Suite 210
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY (541) 687-5603

August 14, 2007

Kathy Parker
U.S. EPA Region 10
1200 Sixth Avenue, Mailstop ECL-116
Seattle, WA 98101

AUG 16 2007

Re: O&M Following EPA Removal Action
Black Butte Mine – Lane County, OR

Dear Kathy:

The Oregon Department of Environmental Quality (DEQ) thanks EPA for its efforts to clean up the former Black Butte mine site. DEQ understands that EPA will complete a planned removal action designed to reduce the potential of future erosion and runoff from tailings and other contaminated soil areas this summer. Further, it is our understanding that the post-removal site control document and EPA anticipate only limited O&M will be necessary following completion of the proposed removal action. We have reviewed the control document provided by your contractor for post-removal operations and maintenance (O&M).

To facilitate implementation of the removal and required follow-up work, DEQ is willing to conduct limited O&M at the site after the removal is completed. Subject to availability of funds and as DEQ's Orphan Account allows, DEQ will conduct annual site inspections of the areas of excavation, sloping, and the soil repository for a period of 10 years. DEQ will identify areas of erosion and may conduct minor repairs as needed. DEQ also may re-seed areas where seed did not provide a reasonable vegetative cover to reduce erosion. DEQ will conduct post removal action sampling and analysis, not to exceed $5,000/year, of surface water and sediment areas to evaluate the effectiveness of the removal. DEQ may be able to conduct additional annual sampling events if funding is available. DEQ will not address any significant failure of the slopes or repository.

Again, DEQ greatly appreciates EPA's support at the former Black Butte mine site and we look forward to the completion of the removal. Please call me at (541) 687-7424 if you have any questions.

Sincerely,

Bryn Thoms, R.G.
Project Manager

Cc: Jeff Christensen, DEQ HQ
Max Rosenberg, DEQ-WR Eugene

Black Butte Mine Site Cleanup
Documents Available for Review

Lane County, OR -- During August 2007, the U.S. Environmental Protection Agency (EPA) cleaned up the former Black Butte Mine Site, located approximately ten miles south of Cottage Grove, Oregon. During the cleanup, mine waste containing mercury and other contaminants was removed from areas adjacent to streams. Waste disposal is on-site under a protective cap.

The Administrative Record containing documents related to the cleanup is available for review at:

Cottage Grove Library
40 South 6th
Cottage Grove, OR 97424
541/942-3828

EPA Records Center
1200 6th Avenue
Seattle, WA 98101
(206) 553-4494.

For more information about the cleanup, please contact: On-Scene Coordinator Kathy Parker at 206-321-3796, parker.kathy@epa.gov; or visit http://www.epaosc.net/BlackButteMineRemoval

Theodore R. Kulongoski
Governor

Statement by Governor Kulongoski on Black Butte Mine
August 30, 2007

"The clean up of Black Butte Mine represents an important event for communities in this region, and for those who care about a healthy Willamette River – a river that supports our economy and communities, and enhances the quality of life for all Oregonians.

"It took several years – and many resources – to assess the scope and impact of mercury contamination at Black Butte Mine. This clean up is happening now as a result of the work of many state and federal agencies and organizations to understand the problem and determine the best way to clean up the site.

"I first visited Black Butte Mine in 2004, and made cleaning up the site a priority as part of my efforts to repair and restore the Willamette River Basin. Last year I asked EPA for assistance and they agreed to fund these clean up actions in partnership with the Oregon Department of Environmental Quality. I am grateful for EPA's commitment to this project to DEQ's continuous efforts.

"As a result of perseverance and a commitment to work together at every level of government, this clean up is finally happening and we can reassure the public that we are protecting our fish and wildlife from further mercury contamination, which in turn is protecting the health and well-being of our children and families.

"While we have much more to do to clean up the entire Willamette River Basin, today represents a significant step forward in restoring the state's treasured gem so that future generations can enjoy a revitalized and healthy river."

- 30 -

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 Emergency Response Unit
1200 Sixth Avenue
Seattle, Washington 98101

Reply To Attn Of: ECL-116

MEMORANDUM

DATE: April 13, 2007

SUBJECT: Request for a Removal Action to be Conducted at the Black Butte Mine, Cottage Grove, Oregon

FROM: Kathy Parker, On-Scene Coordinator
Carl Kitz, On-Scene Coordinator

THRU: Chris D. Field, Unit Manager
Emergency Response Unit, Office of Environmental Cleanup

TO: Daniel D. Opalski, Director
Office of Environmental Cleanup

I. Purpose

The purpose of this action memorandum is to request and document approval of the proposed time-critical removal action described herein for the Black Butte Mine, Cottage Grove, Oregon. The CERCLIS ID No. is OR000515759 and the Site ID No. is 10EK.

This action meets the criteria for initiating a removal action under the National Contingency Plan (NCP), 40 C.F.R. §300.415.

II. Site Conditions And Background

A. Site Description

1. Physical Location

The Black Butte Mine (BBM) is located in southern Lane County, in the Coast Fork Willamette River basin, approximately ten miles south of Cottage Grove, Oregon. The BBM is located on the northwest flank of Black Butte (see Figures I & II.). The legal description of the BBM Site is: Section 16, Township 23 South, Range 3 West. Willamette Meridian.

The BBM is a former mercury mine. From 1927 to 1940, BBM was one of Oregon's largest producers of mercury. Motor vehicle access to the Site is restricted by a locked gate. The road leading to this gate crosses private property owned by Michael Pooler. Michael Pooler is a former BBM worker and currently lives at a home located near the entrance to the Site.

The primary features of the Site include a former mill structure containing a rotary kiln, mercury condenser, and ore storage/crushing equipment (New Furnace Area), another mill and furnace area (Old Ore Furnace), several old dilapidated buildings, a system of unimproved roads, mine adits, and piles of waste rock and mill tailings.

The pile of waste rock and mill tailings located in a relatively flat area below the New Furnace Area is referred to as the Main Tailings Pile. It is bordered on the northeast by Dennis Creek. A mine access road leads from the Pooler's residence up to and over the main tailings pile and continues up beyond the "404" Adit. Tailings in the Main Tailings Pile are gravel-sized with lesser amounts of fine- to sand-sized material. Tailings on the northeast edge of the Main Tailings Pile dip steeply to the northeast toward Dennis Creek.

Remnants of a second waste pile lie to the northwest of the Old Ore Furnace. This area borders Furnace Creek to the southwest. Materials in this area are finer grained than in the Main Tailings Pile. The "404" Adit is located up gradient of the Old Ore Furnace and New Furnace Area. Ore from the "404" Adit historically was transported to the Old Ore Furnace via a tramway. The Dennis Creek Adit is located up-gradient of the New Furnace Area. Ore historically was transported from the Dennis Creek Adit to the New Furnace Area via a railway. Seven adits have been identified in unpublished work completed by the Oregon Department of Environmental Quality (ODEQ). Four or more of these adits are located above the "404" Adit.

Between 1957 and 1995, the mean monthly wind speed averaged between 6.7 and 8.2 mph at the nearest meteorological station in Eugene with recorded wind gusts of up to 56 mph. Between 1943 and 2006, the mean monthly temperature at the Cottage Grove Dam averaged between 32.3F and 79.9F with an average annual precipitation of 47.7 inches/year and an average snow fall of 5 inches per year.

Potential human health and environmental impacts from historic mine wastes present at the BBM Site include public health and safety risks, increased metal concentrations in surface water, and increased sediment load to surface water. Elevated mercury levels in fish found in the Cottage Grove Reservoir pose health risks when eaten. The potential negative health effects of mercury relate to these risk factors:

1. Chemical form of mercury ,
2. Dose,
3. Age of the person exposed (fetuses are more susceptible),
4. Duration of exposure,

5. Route of exposure: inhalation, ingestion, dermal contact,

6. Health of the person exposed.

Surrounding Land Use and Distance to Nearest Populations

The BBM area drains to Dennis Creek and Furnace Creek. Smaller unnamed creeks drain into Dennis Creek from the area above the Main Tailings Pile. Dennis Creek borders the northeast side of the Site and flows westward into Garoutte Creek, approximately 0.25 miles downstream of BBM. The Main Tailings Pile fronts approximately 600 feet of Dennis Creek and mine tailings are located within thirty feet of the creek bed.

Furnace Creek, an intermittent stream, borders the southwest side of the BBM area. Furnace Creek also flows into Garoutte Creek. Furnace Creek is adjacent to the Old Ore Furnace Area and mine tailings are in contact with the creek.

Garoutte Creek flows northward approximately one mile to the Coast Fork Willamette River, which in turn empties into Cottage Grove Lake, a reservoir used extensively for recreational activities including contact recreation (i.e. swimming, canoeing, and scuba diving) and fishing. This lake is visited by almost a half-million people every year for camping, picnicking, swimming, water skiing, fishing and boating.

The aquifers in the vicinity of the BBM are the Fisher Formation (bedrock aquifer) and the alluvial aquifer along Dennis Creek, Garoutte Creek, and the Coast Fork Willamette River. Depth to groundwater and hydraulic conductivity of these aquifers at the BBM Site are unknown. Well logs in the vicinity of the BBM indicate that the shallowest depth to water-bearing strata in bedrock is twenty-nine feet below ground surface (bgs). Local groundwater gradients are unknown but are likely toward the streams. The nearest spring is London Springs, located approximately four miles north of the Site. Its source, use, and quality are unknown.

Vulnerable or Sensitive Populations, Habitats, and Natural Resources

The BBM was identified in recent Total Maximum Daily Load (TMDL) investigations as a significant contributor of mercury to sediment and fish tissue in Cottage Grove Reservoir, located approximately six miles downstream of BBM. Cottage Grove Reservoir and the main stem of the Willamette River, is the nation's thirteenth largest watershed. The Oregon Department of Human Services has issued health advisories to limit consumption of fish harvested from the Cottage Grove Reservoir due to elevated mercury concentrations in fish tissue.

Other Mines in the Area

BBM is located in the upper portion of the Coast Fork Willamette River Watershed (CFW) approximately four miles north of the Calapooya Divide which separates the Willamette River

Basin from the Umpqua River Basin. Two tributaries, Furnace Creek and Dennis Creek, drain the Site and enter Garoutte Creek about 1000 feet west and about 1500 feet northwest of the Site, respectively. Approximately one mile north of the Site Garoutte Creek enters the Coast Fork Willamette which continues northward about six miles where it drains into Cottage Grove Reservoir. The Coast Fork Willamette River continues northward towards the Eugene-Springfield area where it finally meets with the Willamette River.

The Site is situated in the Black Butte-Elkhead Mercury District (District) along with about seven prospects and one other historical mercury producing mine, Elkhead, which is located in the Umpqua Basin. The District spans the Calapooya Divide. The only mercury-producing mine within the CFW is the BBM. There are several prospects within a few miles of the Site, and within the CFW, where cinnabar and related mineralogy have been historically noted, but production did not take place at those locations. BBM is the only significant mercury source in the CFW beyond the local background mercury load from the District soils. Recent reports have shown that the BBM is a significant source of mercury contamination of the Cottage Grove Reservoir as described next.

The abstract of the J-.G. Park and L.R. Curtis report dated July 22, 1997 " Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs: Point Source and Nonpoint-Source Impacted Systems" states, "These results indicated that a point source, Black Butte Mine, contributed amounts of mercury greatly in excess of mobilization from natural deposits, atmospheric deposition, and small scale uses of the metal as an amalgamating agent in gold mining (to Cottage Grove Reservoir)." The final report for the U.S. Army Corps of Engineers "Sources and Chronology of Mercury in the Cottage Grove Reservoir" by Lawrence R. Curtis, Department of Environmental and Molecular Toxicology dated May 20, 2003 also demonstrates that the BBM is the source of mercury contamination found in the Cottage Grove Reservoir. On page 37 in the Conclusions Section, the report states "Elevated mercury concentrations in soils surrounding the Black Butte Mine supports the conclusion that the Black Butte Mine is a point source of contamination to the reservoir".

3. Site Characteristics

The BBM was first put into operation by S. P. Garoutte in 1890 and a 40-ton-per-day Scott-Hutner furnace was installed at the Site. In 1897, the Quicksilver Mining Company took over the property until 1909, when the mine was closed due to depressed mercury prices. During that period of operation, the capacity of the furnace was increased and 15,000 feet of development work was completed.

In 1916, the BBM was reopened by an unnamed New York based company operated by Earl B. Crane. A flotation unit and a redesigned Scott furnace were used from 1916 until 1919, when declining mercury prices again forced the shutdown of the mine.

The BBM was operated by the Quicksilver Syndicate from 1927 to 1942. Two rotary furnaces were installed increasing the mines capacity to 150 tons per day. During this period, old furnace

tailings were re-treated. The mine was closed again in 1943.

In 1956 and 1957, the mine was leased by Mercury & Chemicals Corporation of New York. The uppermost levels of the mine (900 and 1,100 foot levels) were explored and developed during this time. Mining operations ceased during 1957.

In January 1994, BBM was purchased by the Land and Timber Company, which is still the current owner.

4. Release or Threatened Release Into The Environment Of A Hazardous Substance, Or Pollutant Or Contaminant

The contaminant of concern, mercury, is a hazardous substance and pollutant or contaminant as defined by sections 101(14) and 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601(14) and (33).

EPA's technical support contractor, Ecology & Environment, Inc. completed a Site investigation of the BBM Site in 2005. This investigation characterized mining-related impacts. Sampling data was collected from the five main areas. These are the Main Tailings Pile, the new furnace area, the Old Furnace Area, the three creeks, Dennis Creek Adit and the "404" Adit. The extent of mercury contamination is summarized in the investigation and compared to various benchmarks. Table 1 lists these benchmarks by media type and constituent. Analytical results also are presented in Tables 2 through 6. Mercury and arsenic concentrations in waste rock and tailings were compared to EPA Region 9 Preliminary Remediation Goals (PRGs) and ODEQ Maximum Allowable Soil Concentrations (MASCs) for both residential and industrial soils. Concentrations of mercury in sediment were compared to EPA Region 9 residential soil PRGs, National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRT) threshold effects levels (TELs) and probable effects levels (PELs) for fresh water sediment (Buchman 1999), and ODEQ Level II Screening Level Values (SLVs) for soil. Concentrations of mercury in surface water were compared to EPA National Recommended Water Quality Criteria (NRWQC) and ODEQ Level II SLVs for fresh water. For the purpose of interpretation of sampling results, analytical data are compared to the most conservative criteria of those listed above and in Table 1.

Total mercury in waste rock/tailings samples collected during the 2005 Removal Assessment and the 1999 Site Investigation of Black Butte Mine ranged in concentration from 1.13 to 54,300 mg/kg. Total mercury concentrations in waste rock/tailings samples collected from the Main Tailings Pile and near the Old Ore Furnace ranged from 1.13 to 2,420 mg/kg. In the New Furnace area, total mercury concentrations in waste rock/tailings/soil samples ranged from 91.9 to 54,300 mg/kg. The high concentrations of mercury in the immediate area of the mill structure and furnace are likely the result of localized spillage of elemental mercury during processing activities. SPLP analyses for mercury leachate were non-detects indicating mercury is being transported from the Black Butte Mine to surrounding creeks via erosion and not leaching.

Total mercury in sediment samples collected during the 2005 Removal Assessment from Dennis Creek, Furnace Creek, and Garoutte Creek ranged in concentration from 0.45 to 37.4 mg/kg. The total mercury concentration of 37.4 mg/kg was from a location in Furnace Creek where tailings were present in the creek.

In 2002, Oregon State University (OSU) collected six surface sediment samples along a longitudinal transect through the center of Cottage Grove Reservoir. Total mercury in these sediment samples ranged in concentration from 0.7 to 3.6 mg/kg. OSU also collected three sediment cores from the Cottage Grove Reservoir to examine the variation of mercury deposition within the reservoir over time. Total mercury in sediment cores ranged in concentration from 0.5 to 3.9 mg/kg. The concentration of total mercury varied over core depth with the highest values occurring from 32 to 34 cm depth (corresponding to a period of deposition in the mid-1960's).

Tissue samples from five largemouth bass were analyzed in an OSU study from 1990. Muscle tissue from the oldest two fish showed mercury concentrations of 1.49 to 1.79 ppm (or mg/kg). Ten largemouth bass were also collected from Cottage Grove Reservoir in 1998 by Oregon DEQ. Total mercury concentrations in muscle tissue from ten fish ranged in concentration from 0.86 to 1.6 mg/kg.

The owner, Land and Timber Company, has used the property for logging. Future use of this Site may continue to be logging or may eventually become recreational. Because of the possibility of recreational use, the residential PRGs and MASCs are referenced for interpretation of analytical results. Although residential values are more conservative than industrial values, the ODEQ considers residential values more appropriate to evaluate potential recreational use than industrial values.

The total mercury concentration in the surface water sample, where waste rock/tailings are in contact with Furnace Creek exceeded both the NRWQC - CMC for mercury and the ODEQ Level II SLV (aquatic) for mercury.

All of the sediment samples, including the background samples, exceeded ODEQ Level II soil SLV for invertebrates for mercury. However, only the sediment sample from Furnace Creek substantially exceeded the background total mercury concentration.

The EPA Region 9 PRG (residential) for total mercury was exceeded for soil samples in the Main Tailings Pile, the Old Ore Furnace area, and the New Furnace area.

5. NPL Status

The Site is not listed on the National Priorities List (NPL) nor has the Site been proposed for the NPL.

B. Other Actions To Date

1. Previous Actions

There have been no previous removal actions at the BBM Site. However, there have been a number of previous sampling events. In July 2004, ODEQ asked EPA to conduct a removal assessment. In May 2005, the EPA Region 10, Office of Environmental Cleanup tasked Ecology and Environment to conduct a removal assessment. The field work was performed in September 2005, and the final report delivered to EPA on March 31, 2006. Prior sampling or assessment events include:

- 1990, an OSU study of mercury in fish in the Cottage Grove and Dorena Reservoirs, published in the report: "An Ecosystem Approach to Mercury Bioaccumulation by Fish in Reservoirs" by S.M. Allen-Gil, D.J. Gilroy and L.R.Curtis, Oregon State University Department of Fisheries and Wildlife, 1990;

- 1996, an ODEQ preliminary assessment, published in the report: "Preliminary Assessment, Black Butte Mine..." by Keith Andersen, Oregon Department of Environmental Quality, for David Bennet, April 1, 1998;

- 1998, an EPA Site inspection published in the report: "Black Butte Mine Site Inspection Report TDD 98-04-0004" by Ecology and Environment, Inc., prepared for Mark Ader, April 1998;

- 2003, U.S.ACE study published in the report: "Sources and Chronology of Mercury Contamination in Cottage Grove Reservoir for U.S. Army Corps of Engineers, Portland, Oregon" by L.R. Curtis, Oregon State University, May 20, 2003;

- 2004, an ODEQ study published in the report: "Reconnaissance Soil Sampling at the BBM for ODEQ", by Oregon State University, August 9, 2004.

2. Current Actions

There are no current EPA actions at the Site, other than the planning for a Superfund Lead Removal Action.

C. State and Local Authorities' Roles

1. State and Local Actions To Date

The ODEQ performed a preliminary assessment (PA) in 1996. The PA was conducted to identify potential public health and environmental threats related to the Site. The scope of the investigation included a review of available file information, interviews, a target survey, and an on-site reconnaissance inspection. No new sampling was conducted for this assessment. Based on the work conducted under this PA, ODEQ recommended a Site Inspection be carried out to

more fully evaluate the threat associated with the mine and tailings pile. There have been no other state or local actions conducted within the affected waters to address the mine waste contaminants. August 12, 2002 memorandum by Amanda Spencer, ODEQ requested official designation of the BBM as an "Orphan Site" and to make (the) Site account available for funding of stabilization and cleanup of the mine. In that memorandum Amanda Spencer stated that the land owner, The Land and Timber Company, was unwilling to complete the investigation/ cleanup the BBM Site. A letter dated May 26, 2006 from Kerri L. Nelson, ODEQ, to Chris Field, requested EPA carry out a removal action. This request was made "due to limited funding in the ODEQ Orphan Account".

2. Potential for Continued State and Local Response

ODEQ will conduct post removal sampling to verify removal effectiveness and help to determine if any additional cleanup work is required by the state and conduct yearly inspections of the repository and covered areas.

3. Tribes and Cultural Resources

a. Tribes

In June 2006, OSC Carl Kitz notified Preston Sleeger with the U.S. Department of Interior by phone and by email of the pending removal action and provided background information on the Site. Mr. Sleeger informed Mr Kitz that there are no tribes in the BBM drainage area, including the Willamette River. To help ensure that no Tribal concerns were overlooked, information concerning the proposed removal work was shared with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw, Cow Creek, The Cow Creek Band of Umpqua Indians, and the Confederated Tribes of Siletz. No concerns regarding the proposed removal action have been reported by any Tribes.

b. Cultural Resources

The State Archaeologist, with the State Historic Preservation Office (SHPO), was sent information about the planned removal work. Based on the concerns/feedback from the SHPO a Cultural Resource Survey was initiated. Archaeological Investigations Northwest, Inc. (AINW) was contracted through Ecology and Environment, Inc. to conduct an archaeological survey of the project Area of Potential Effects (APE) to address the project's possible impacts on significant archaeological resources . As the project is a federal undertaking, AINW's work was done in compliance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations (36 C.F.R. § 800), and according to the requirements of the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.

Records from the Oregon State Historic Preservation Office (SHPO) were reviewed to determine if archaeological Sites had been recorded or if archaeological surveys had been conducted in the vicinity of the Black Butte Mine. A review of the National Register of Historic Places was also

conducted to determine if any listed archaeological or historic properties are located in or near the proposed project area. The results indicated that no listed archaeologicals are in or near the proposed project area. A review of the SHPO database, which is a listing of the Oregon Inventory of Historic Properties, indicated no inventoried resources were located in the proposed project area.

4. EPA Region 10 Regional Mining Team

Patricia McGrath of the EPA Region 10 Mining team was briefed on the pending removal and agreed with the need for a clean-up at the BBM and the proposed removal actions. The BBM is the only mercury mine with drainage to the Cottage Grove Reservoir.

III. Threats To Public Health Or Welfare Or The Environment, And Statutory And Regulatory Authorities

In determining the appropriateness of this removal action, EPA considered all the factors listed in Section 300.415(b)(2) of the NCP. The factors set forth below apply to this removal action based upon the current conditions at the BBM Site. EPA has determined that the Site is a threat to the public health or welfare or the environment, and a removal action is appropriate under Section 300.415(b)(2) of the NCP. Any or all of these factors may be present at a Site, and any one of these factors may determine the appropriateness of a removal action.

A. Threats to Public Health or Welfare

1. Exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants (300.415[b][2][i])

The elevated concentrations of mercury in waste rock and tailings of the Main Tailings Pile, Old Furnace area, New Furnace Area, and Furnace Creek and proximity to Dennis, Furnace and Garoutte Creeks indicate that human exposure pathways exist. A report by J-.G. Park and L.R. Curtis dated July 22, 1997 "Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs: Point-Source and Nonpoint-Source Impacted Systems"states that the BBM is the source of elevated levels of mercury in Cottage Grove Reservoir fish. Table 5-3 of the 2005 EPA Removal Assessment Report shows the elevated levels of mercury in sediments that were deposited as a result of the BBM.

2. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate (300.415[b][2]iv])

The mine waste contaminated soils are not vegetated, thus the soils are susceptible to migration because of water- and wind-borne influences. Erosion throughout the contaminated materials is widespread and moving this material into the active waterways of Dennis, Furnace and Garoutte Creeks and elsewhere throughout the Site.

3. Minimization or elimination of the effects of weather conditions that may cause hazardous substances, pollutants or contaminants to migrate or to be released (300.415[b][2][v])

Mine wastes are slumping and eroding directly into the creeks with subsequent transport downstream. During the springtime, snow melt, rainfall or other run-off inducing events tend to spread the contaminated materials further from the Site. The warmer temperatures and dry weather typical in the summer and fall months in and near the Site contribute to wind-borne dispersal of mine-contaminants.

4. Availability of other appropriate federal or state response mechanisms to respond to the release (300.415[b][2][vii])

The ODEQ does not have the resources to provide the appropriate timely response needed to address actual or potential human health and ecological risks associated with the mine waste contaminants described herein. No other state or federal resources have been identified to provide a timely response.

B. Threats to the Environment

1. Exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants (300.415[b][2][i]

Ecological receptors have been exposed to Site contaminants through direct contact with mine waste contaminated materials and with water and sediments contaminated by mine-waste materials; ingestion of mine-waste materials and water and sediments contaminated by mine-waste materials; and / or ingestion of contaminated food (e.g., sediment- or soil-dwelling insects, vegetation). Highly contaminated sediment from the mine Site is likely being transported downstream.

2. Actual or potential contamination of drinking water supplies or sensitive ecosystems (300.415[b][2][ii])

The concentration of mercury in Furnace Creek is likely a result of mine waste materials migrating off the Site. Excavation of the mine waste contaminated materials is anticipated to have a positive effect on surface water quality and the sensitive aquatic ecosystem of Furnace Creek.

3. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate (300.415[b][2]iv])

There is cause for concern near the Black Butte Mine Site and for some distance downstream in Dennis, Furnace and Garoutte Creeks because of the likelihood for continued erosion of contaminated materials into the stream and subsequent downstream material migration.

Recovery and restoration efforts for fish and other species could only be enhanced with improved water quality in Cottage Grove Reservoir and the Willamette River drainage.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances from this Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. Proposed Actions And Estimated Costs

The following objectives, which are designed to address the aforementioned threats to human health or welfare and the environment, have been developed for the Site:

- Mitigate exposure pathways to mine waste contaminated soils and sediments through excavation and containment of the contaminated materials.

- Reduce sediment loading in Dennis and Furnace Creeks to reduce mercury contamination in the creeks, Cottage Grove reservoir and Willamette River.

Starting and completion dates for the proposed work depend on the weather. Based on the analysis of the nature and extent of mine waste contamination and the response objectives listed in the preceding paragraph, the following three alternative actions were evaluated for the BBM:

- Alternative 1 - No action. Site conditions remain unaltered and risks to human health and the environment persist.

- Alternative 2 – Construction of an engineer designed on-site repository for permanent storage of excavated materials; excavation of mercury contaminated mine tailings along adjacent creeks, and other highly mercury contaminated soils located on the Site; consolidation of such material in the repository. After completion of the excavation work, capping the repository with clean soil and hydro-seeding the cap to prevent erosion.

- Alternative 3 - Excavation of mine waste, contaminated soil and sediment, and transport to an off-site landfill; reconstruction of the creek channels; and grading, revegetation, and erosion protection of disturbed areas.

Alternative 1 was not selected because it would not address the actual or potential imminent and substantial human health and ecological threats posed by the mine-waste-contaminated soils and sediments. Alternative 3 was not selected because of the substantial disposal-related costs which would be incurred with transport to an off-site repository, and damage to the creek beds. Alternative 2 was selected as it would provide protection from direct contact and significantly reduce the off Site migration of mercury to adjacent creeks and downstream waterways.

A. Proposed Actions

1. Proposed Action Description

Alternative 2 is the proposed action (as described below) consisting of excavation of mine tailings and contaminated soils, and consolidation beneath a soil capped repository constructed on-site. The identification of mine waste contaminated materials will be accomplished by removing the visible mine tailings, and with confirmation by systematic field screening of surface soils with a field portable X-ray fluorescence (FPXRF) instrument using ODEQ soil cleanup guidelines for mercury. The following excavation work is proposed:

- 30,000 cubic yards tailings excavated from the Main Tailings Pile.
- 3,000 cubic yards excavated from the Old Ore Furnace and Furnace Creek areas.
- 2,000 cubic yards excavated from the New Furnace Area.

The cleanup goal for mercury in the Main Tailings Pile is 8 to 10 mg/kg (background levels). Cleanup in other highly contaminated areas identified above will be excavation, to the extent practicable, to less than EPA region 9 PRG of 115 mg/kg (adjusted for mercury sulfide).

REPOSITORY

The repository area has been surveyed and the conceptual design has also been completed. Final design plans for the removal work, including repository design, excavation work, and cover for excavated areas and repository were prepared by E&E in March 2007. A post cleanup plan is currently being prepared by E&E which will describe the necessary actions, such as deed

restrictions, required to maintain the integrity of the repository after the removal is completed.

MAIN TAILINGS PILE

The waste rock/tailings on the north-northeast edge of the main waste rock/tailings on the side sloping toward Dennis Creek are unstable and subject to erosion and undercutting by water erosion from unnamed tributaries of Dennis Creek. Removal and stabilization of the waste rock/tailings in this area will be performed.

NEW FURNACE AREA

In the New Furnace Area, contaminated soils in the immediate area of the mill structure will be covered with clean soil.

OLD ORE FURNACE

In the Old Ore Furnace area, contaminated soils will be removed in the immediate area of the furnace structure and Furnace Creek.

Best Management Practices

Temporary Best Management Practices (BMPs) will be employed throughout the removal action. This will include control of erosion, control of fugitive dust, and storm water management.

2. Contribution to Remedial Performance

ODEQ concurs on the proposed removal action and the consistency of that action with any future actions the state may take with regard to the Black Butte Mine Site.

3. Description of Alternative Technologies

No other technologies were considered practical from economic, engineering, and/or timing perspectives.

4. EE/CA

An engineering evaluation/cost analysis (EE/CA) is not required for an EPA time-critical response action.

5. Applicable or relevant and appropriate requirements

The NCP requires that removal actions attain Applicable or Relevant and Appropriate Requirements (ARARs) under federal or state environmental or facility siting laws, to the extent practicable (40 C.F.R §300.415[j]). In determining whether compliance with ARARs is practicable, EPA may consider the scope of the removal action and the urgency of the situation. (40 C.F.R. §300.415[j]).

a. Federal

1. The substantive provisions of Section 404 of the Clean Water Act (CWA), 33 U.S.C. §1344, are applicable requirements and will be met to the extent practicable. For example, the proposed removal action will be conducted to avoid the discharge of dredged or fill material into navigable waters, through the use of BMPs, such as silt fences, hay bales, or other means necessary to control potential discharge from the Site.

2. In accordance with the Endangered Species Act of 1973, 16 U.S.C. §1531 et. seq., EPA will consult with the U.S. Fish and Wildlife Service regarding potential effects on federally listed species and their habitats prior to performing the proposed removal action.

3. The tailings left from mining activities at Black Butte Mine were created from beneficiation and extraction processes at the Site and hence are subject to the "Bevill Exemption," described in 40 C.F.R. §261.4(b)(7), which exempts the tailings from being defined as RCRA hazardous

waste. Although the two furnaces on the Site were used by the mine, no process waste has been identified in any of the areas that this removal action will address.

b. State

1. To the extent practical, O.A.R. 340-122-70 (removals) Oregon Cleanup Rules will be addressed. Oregon Cleanup Rules allow consideration for the lowest cost cleanup measure, which often is capping in place. In addition, a removal action under state rules is not considered a final remedy thus allowing for flexibility in generating a Site-specific cleanup level. Residual risk, cost, and practicality should all be evaluated in order to make a reasonable Site-specific cleanup level. Final remedy-specific actions, such as the hot spot evaluation and a 10^{-6} risk evaluation for residual contaminants should be addressed, if practical.

2. Any discharge to the waters of the state fall under the Oregon Water Quality Rules, O.A.R. 340, Division 41. The substantive requirements of these rules will be met during the removal action. In general, the ODEQ rules mimic the federal rules and therefore the substantive requirements of O.A.R. 340-41 will be met as long as the federal requirements are met. BMPs and erosion-control will limit the runoff of turbidity and heavy metals.

3. The Oregon Air Pollution Control Regulations and Oregon Emission Standards for Hazardous Air Pollutants, O.A.R. 340, Division 200 and 246, respectively, are potentially applicable if heavy-metal contaminated dust is generated above regulatory thresholds. BMPs such as dust control will be used to mitigate the generation of fugitive dust which will meet the substantive requirements of these rules.

4. Oregon Hazardous Waste Regulations, O.A.R. 340, division 100 through 103, may be applicable if liquid mercury waste is found on Site. The substantive requirement of this rule will be met if hazardous wastes are encountered during the removal.

5. Oregon Department of State Lands Rules, O.A.R. 141, division 85, may be applicable if excavation activities are conducted below the seasonal high water line of Dennis or Furnace Creeks. Work conducted below the seasonal high water mark of the creeks is considered work within waters-of-the-state and therefore the substantive requirements of these rules should be met.

6. Oregon Fish and Wildlife Department Rules for in-stream water rights and fish passage, O.A.R. 635, Division 400 and 412, may be applicable if excavation activities are conducted below the seasonal high water line of Dennis or Furnace Creeks. The substantive requirements of these rules will be met if excavation is conducted below the seasonal high water line of Dennis or Furnace Creeks.

6. Project Schedule

The starting date for the Removal Action is dependent on weather conditions and snow at the

Site. We anticipate beginning removal action work in the Spring of 2007, with the on-site work taking approximately 30 to 40 days.

B. Estimated Costs

Regional Removal Allowance Costs	
ERRS (Construction, equipment, and material including 15% contingency)	$587,000
Other Extramural Costs Not Funded from the Regional Allowance	
START	$100,000
Coast Guard Strike Team	$10,000
Total Extramural costs	$697,000
Project Cost Contingency (20%)	$140,000
TOTAL REMOVAL PROJECT CEILING	$837,000

VI. Expected Change In The Situation Should Action Be Delayed Or Not Taken

The Action Memorandum approval process was initiated in September 2006. Weather conditions at the Site did not allow the removal action to start until the Spring of 2007. If the response action should be delayed or not taken hazardous substances will remain as potential human health and ecological threats, based on ingestion exposure pathways; and hazardous substances will remain a continuing source of solid and dissolved-phase contaminants.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

See attached Confidential Enforcement Addendum.

IX. Recommendation

This decision document presents the selected removal action for the BBM Site, Lane County, Oregon, developed in accordance with CERCLA, as amended. It is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

See attached Confidential Enforcement Addendum.

IX. Recommendation

This decision document presents the selected removal action for the BBM Site, Lane County, Oregon, developed in accordance with CERCLA, as amended. It is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP, 40 C.F.R. § 300.415(b)(2), criteria for a removal action and we recommend your approval for the proposed removal action. The total project ceiling if approved will be $ 831,900. Of this, an estimated $523,250 comes from the Regional removal allowance.

Approval:

Signature: _____ Date: 6/27/07

Daniel D. Opalski, Director
Office of Environmental Cleanup

Disapproval:

Signature: _____ Date:

Daniel D. Opalski, Director
Office of Environmental Cleanup

Documents Referenced for Administrative Record:

1. "Water to Woods, Part II: Cottage Grove Community and Parks System Overview", Cottage Grove Community Development Department. 3/16/2007 website: http://www.cottagegrove.org/commdev/parksplan/Part%20II.pdf.

2. "Sources and Chronology of Mercury Contamination in Cottage Grove Reservoir for U.S. Army Corps of Engineers, Portland, Oregon" by L.R. Curtis, Oregon State University, May 20, 2003.

3. "Elevated Levels of Mercury in Sport Caught Fish From Cottage Grove Reservoir in Lane County" April 22, 2004, Bonnie Widerburg, Environmental Toxicology, Oregon Department of Human Services. 3/16/2007 website: http://www.oregon.gov/DHS/ph/envtox/2004-0422.shtml.

4. "Fish Advisories: Consumption Guidelines", 3/16/2007 website: http://www.oregon.gov/DHS/ph/envtox/fishconsumption.shtml.

5. "Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs in Point Source and Non-Point Source Impacted Systems", J-G. Park, L.R. Curtis, OSU, Archives of Environmental Contamination and Toxicology 33,423-429 (1997), accepted July 22,1997.

6. "Black Butte Mine Site Removal Assessment Report, Lane County, Oregon, TDD 06-01-0005" by Ecology and Environment, Inc., prepared for Marc Callaghan, March 21, 2006.

7. "Reconnaissance Soil Sampling at the BBM for ODEQ", by Oregon State University, August 9, 2004.

8. "Black Butte Mine Site Inspection Report TDD 98-04-0004" by Ecology and Environment, Inc., prepared for Mark Ader, April 1998.

9. "Preliminary Assessment, Black Butte Mine" by Keith Andersen, Oregon Department of Environmental Quality, for David Bennet, April 1, 1998.

10. "An Ecosystem Approach to Mercury Bioaccumulation by Fish in Reservoirs" by S.M. Allen-Gil, D.J. Gilroy and L.R.Curtis, Oregon State University Department of Fisheries and Wildlife, 1990.

11. "Archeological Survey at the Black Butte Mine, Lane County, Oregon", by Archeological Investigations Northwest, Inc. for EPA, February 20, 2007.

12. "Mercury in Oregon Lakes" by A. Newell, D. Drake, and B.L. Stifel, Oregon Department of Environmental Quality, May 1996.

13. "DEQ Request for EPA Removal at Black Butte Mine – Lane County, OR", Letter from Kerri L. Nelson ODEQ Western Regional Administrator to Chris Field, EPA Removal Manager, May 26, 2006.

14. "Independent Government Cost Estimate (IGCE), Black Butte Mine, Cottage Grove, Oregon", prepared by Carl Kitz, 2006.

15. Western Regional Climate Center, Historical Climate Information, accessed on 4/12/2007 from web site: http://www.wrcc.dri.edu/climatedata.html.

16. Personal Conversation log between Carl Kitz and Patricia McGrath, EPA Mining Coordinator, June 12, 2006.

17. Phone Conversation log between Carl Kitz and Preston Sleeger, Department of Interior, June 2006.

18. "Black Butte Mine Preliminary Potentially Responsible Party Search", EPA Memorandum from Gretchen F. Schmidt to Carl Kitz, June 22, 2006.

Figure # 1

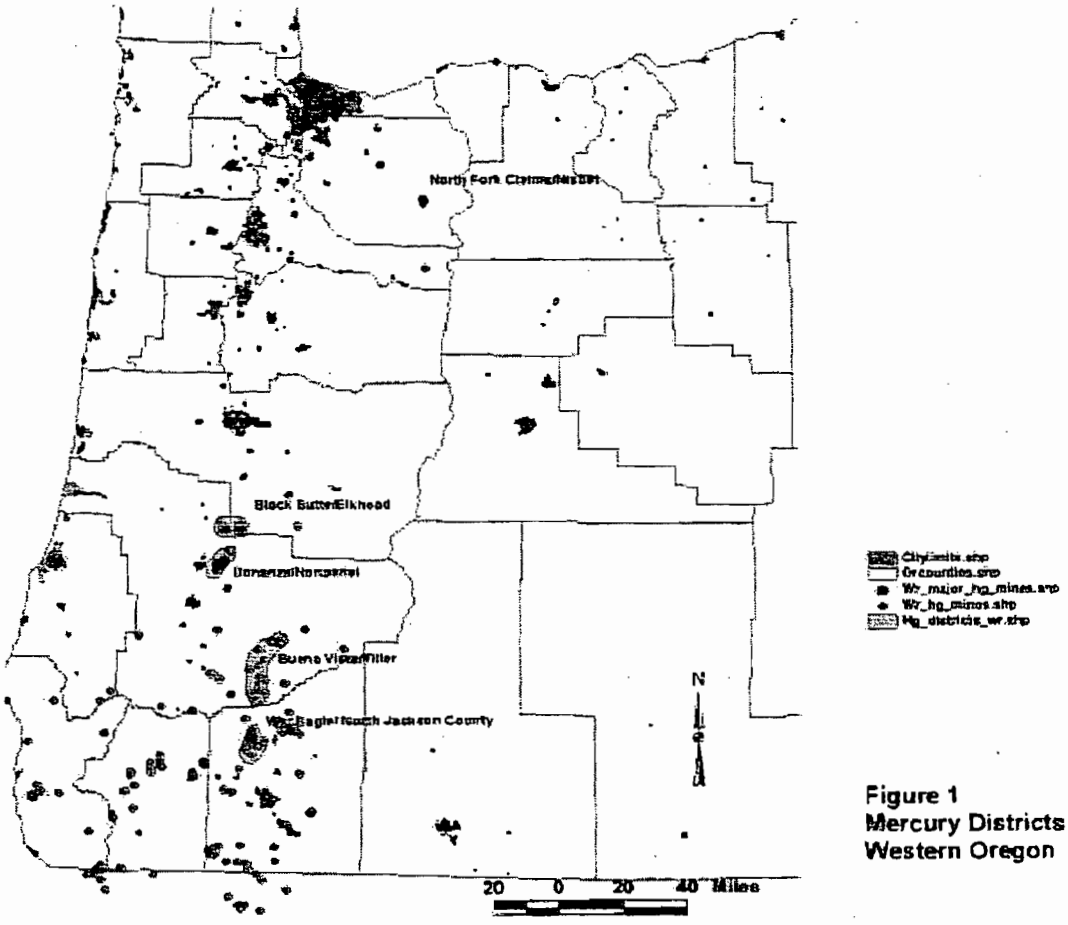


Figure 1
Mercury Districts
Western Oregon

Figure # 2

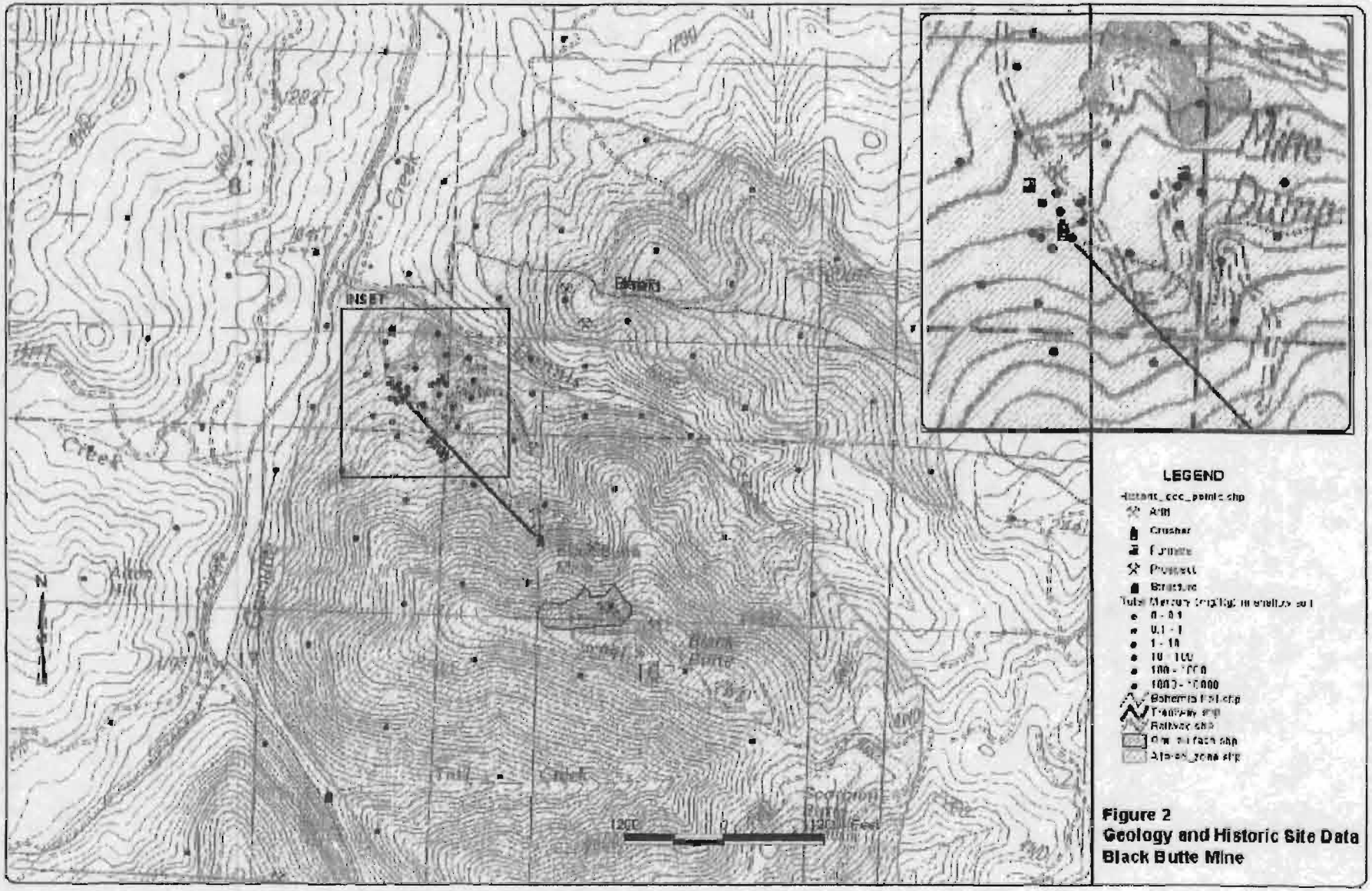
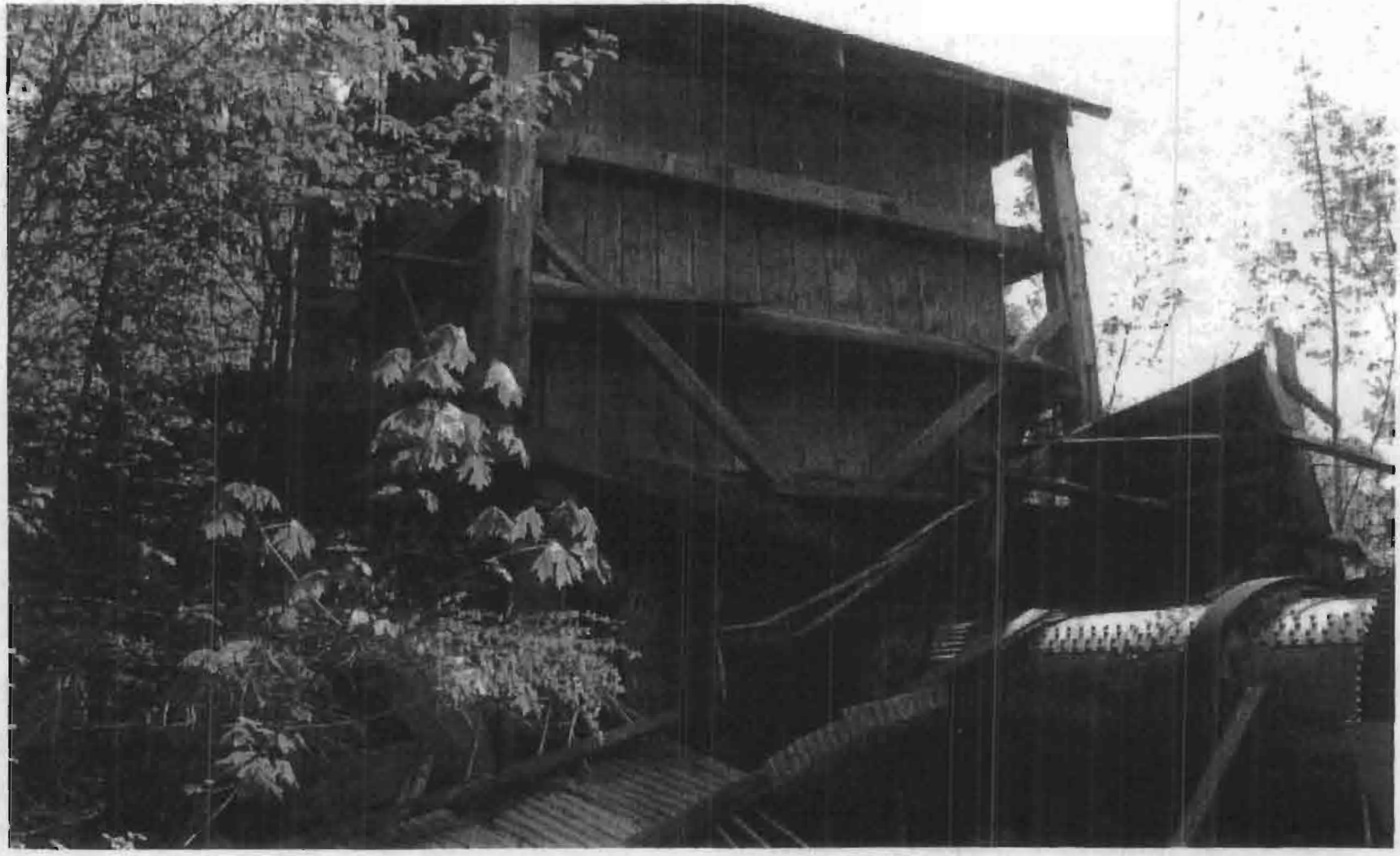

INSET
Mine
Dump
LEGEND
Figure 2
Geology and Historic Site Data
Black Butte Mine

Figure 3. Black Butte Mine Area Map

Figure # 4

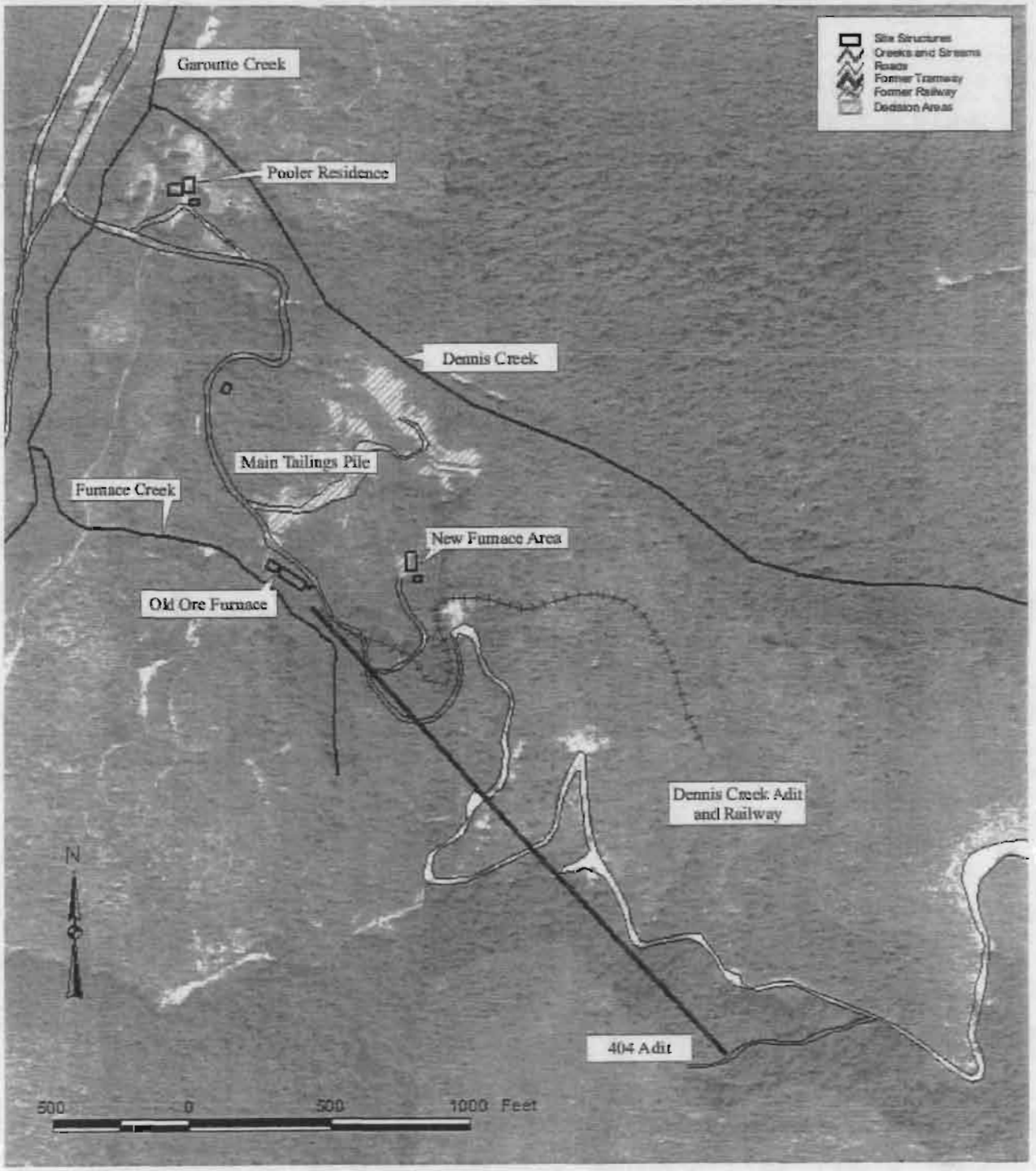
Old Ore Furnace

Figure # 5



New Furnace

Figure 7. Black Butte Mine



List of Tables and Photographs:

CONCURRENCE SHEET
Black Butte Mine Action Memorandum

NAME	INITIALS	DATE
Kathy Parker		4/13/2007
Chris Field		
Cliff Villa		4/13/2007

Appendix C

Site Specific Sampling Plan and Data Validation Memorandum

SITE SPECIFIC SAMPLING PLAN
Project Name: Black Butte Mine Removal Action
Site ID: 10EK

APPROVALS			
Name	**Title**	**Signature**	**Date**
Kathy Parker	On-Scene Coordinator (OSC)		8/16/2007
Michael Boykin	Emergency Response Unit (ERU) Quality Assurance Coordinator (QAC)		17 Aug 07
Erin Lynch	START-3 Project Manager		
Mark Woodke	START-3 Quality Assurance Officer		

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan for the Emergency Response Unit for collecting samples during this Removal Program (RP) project. Refer to the QAPP for additional details relating to the SSSP.

Additional Personnel and Affiliations involved in the project:

United States Environmental Protection Agency (EPA) OSC			
Kathy Parker	USEPA M/S: ECL-116 1200 Sixth Avenue, Seattle, WA 98101	(206) 321-3796	parker.kathy@epa.gov
ERU QAC			
Michael Boykin	USEPA M/S: ECL-116 1200 Sixth Avenue, Seattle, WA 98101	(206) 553-6362	boykin.michael@epa.gov
Ecology and Environment, Inc. (E & E), START-3 Project Manager			
Erin Lynch	Ecology and Environment, Inc. 333 SW Fifth Avenue, Suite 608 Portland, OR 97204	(503) 248-5600	elynch@ene.com
Analytical Laboratory, Project Manager			
NA			

Physical Description and Contact Information

Site Name	Black Butte Mine	
Site Location	South end of London Road, Lane county, Oregon Section 16, Township 23 South, Range 3 West, Willamette Meridian	
	Latitude: 43°34.727 North	Longitude: 123° 04.134West
Property size	Acres: approximately 20 acres in the affected area	
Site Contact	Name: Robert Smejkahl 696 County Club Road, Eugene OR 97401	Phone Number: (541) 345-3330
Site Owner	Name: Land and Timber Company	Phone Number: NA
Site Operator	Name: site is not in operation	Phone Number: NA
Nearest Residents	Distance: Michael Pooler	Direction: west
Primary land uses surrounding the site	Timber	

The Data Quality Objective process will be used to determine all sample locations.

Historical and Background Information

The section upon which the Black Butte Mine (BBM) sits is currently owned by the Land and Timber Company, which purchased it in January 1994 for timber harvesting. The BBM is located in southern Lane County, in the Coast Fork Willamette River basin, approximately fifteen miles south of Cottage Grove, Oregon. From 1927 to 1940, BBM was one of Oregon's largest producers of mercury. Motor vehicle access to the Site is restricted by a locked gate. The road leading to this gate crosses private property owned by Michael Pooler, a former BBM worker who currently lives with his wife at a home located near the entrance to the Site.

The primary features of the Site include a former mill structure containing a rotary kiln, mercury condenser, and ore storage/crushing equipment (New Furnace Area), another mill and furnace area (Old Ore Furnace), several old dilapidated buildings, a system of unimproved roads, mine adits, and piles of waste rock and mill tailings. Potential human health and environmental impacts from historic mine wastes present at the BBM Site include public health and safety risks due to mercury and arsenic in soil on the site, increased metal concentrations in surface water, and increased sediment load to surface water. Elevated mercury levels in fish found in the Cottage Grove Reservoir pose health risks when eaten. The BBM area drains to Dennis Creek and Furnace Creek. Smaller unnamed creeks drain into Dennis Creek from the area above the Main Tailings Pile. Dennis Creek borders the northeast side of the Site and flows westward. Furnace Creek, an intermittent stream, borders the southwest side of the BBM area. Furnace Creek also flows into Garoutte Creek. Furnace Creek is adjacent to the Old Ore Furnace Area and mine tailings are in contact with the creek.

Total mercury analytical results in waste rock/tailings samples collected during the 2005 Removal Assessment and the 1999 Site Investigation of Black Butte Mine ranged in concentration from 1.13 to 54,300 milligrams per kilogram (mg/kg). Total mercury concentrations in waste rock/tailings samples collected from the Main Tailings Pile and near the Old Ore Furnace ranged from 1.13 to 2,420 mg/kg. In the New Furnace area, total mercury concentrations in waste rock/tailings/soil samples ranged from 91.9 to 54,300 mg/kg. The high concentrations of mercury in the immediate area of the mill structure and furnace are likely the result of localized spillage of elemental mercury during processing activities. Synthetic Precipitation Leaching Procedure (SPLP) analyses for mercury leachate were non-detects suggesting mercury is being transported from the Black Butte Mine to surrounding creeks via erosion and not leaching.

Total mercury in sediment samples collected during the 2005 Removal Assessment from Dennis Creek, Furnace Creek, and Garoutte Creek ranged in concentration from 0.45 to 37.4 mg/kg. The total mercury concentration of 37.4 mg/kg was from a location in Furnace Creek where tailings were present in the creek.

The R9 Preliminary Remediation Goal (PRG) for residential soil of 23 mg/kg will be used as a cleanup goal for soil in areas of the site where the exposure pathway is strictly dermal contact and the previous sequential extraction procedure indicates soluble forms of mercury are present (the Old Furnace Area). For the areas where the exposure pathway is strictly dermal contact and the previous sequential extraction procedure indicates soluble forms of mercury are not present (the New Furnace Area), then the cleanup goal of 115 mg/kg will be used. The 115 mg/kg figure is derived by converting the R9 residential PRG from mercuric chloride to mercuric sulfide based on toxicity for dermal contact as calculated by Stan Smucker. The Removal Assessment data shows that in the Old Furnace area there is 43% to 47% soluble mercury present but negligible amounts in the New Furnace Area.

The background level of 10 mg/kg will be used for the clean up goal in areas where soil and sediment can be transported off-site through water or soil migration. This concentration is based on the background level of mercury in soil in uncontaminated areas in the locale.

Starting in August 2007 EPA will be performing the following tasks as part of a removal action:

- Site clearing and excavation of clean fill;
- Removal of tailings from the main tailings pile to reduce the grade of the pile;
- Removal of mercury contaminated sediment from Furnace Creek;
- Removal of mercury contaminated soil from near the Old Furnace;
- Cover mercury contaminated soil near the New Furnace with clean fill;
- Seed the tailings pile in the fall as the rains start.

There are no anticipated sampling constraints. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	July 30, 2007	August 18, 2007	
Mobilize to Site / Site Removal Activities	August 19, 2007	September 20, 2007	

Sample Collection	August 20, 2007	September 20, 2007	
Laboratory Sample Receipt	none	none	
Laboratory Analysis	none	none	
Data Validation	October 1, 2007	October 31, 2007	
Draft Report	November 30, 2007		
Target Completion Date	December 31, 2007		

Conceptual Site Model

The conceptual model of contamination with respect to this sampling plan is the following:

- Mercury contaminated soil is made waterborne by the action of rain and wind transporting it to the Dennis and Furnace Creeks where it moves downstream to Cottage Grove reservoir thus contaminating sediment, invertebrates, fish and human drinking water.
- Mercury contaminated soil comes into contact with humans such a s trespassers and recreational users as well as animals by direct contact as they walk on the soil at the site.

Decision Statement

The decision to be made from this investigation is to:

- Determine where mercury-contaminated soil and sediment above the action levels are located in the decision areas;
- Determine during soil removal or covering when the soil remaining in each decision area is below the action levels and requires no further action.

Inputs into the Decision

The following inputs to the decision are necessary to interpret the analytical results:

- Location and concentration of total mercury in soil and sediment

Sample Collection Information

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:

1. Ecology and Environment's START3 Field Activity Logbook SOP
2. Ecology and Environment's START3 Sample Packaging and Shipping SOP
3. Ecology and Environment's START3 Sampling Equipment Decontamination SOP
4. Mercury Instrument Method for Lumex with soil attachment
5. Mercury Instrument Method for XRF and SW846 Method 6200

Mercury in Soil will be analyzed by XRF, either in situ or collected, air dried (at less than 60 degrees C) and analyzed in plastic bags. If the reporting limit of the XRF cannot reach 10 mg/kg, samples below the reporting limit will be analyzed as needed by Lumex with soil attachment.

Mercury in Sediment with visible moisture content (greater than 20%) will be analyzed by Lumex with soil attachment. If the moisture content is low, the sample will be analyzed by XRF unless it is below the XRF reporting limit.

Decision Areas

The Decision Area boundaries for the site are:

- The New Furnace area, outside of the structures
- The Old Furnace area (not marked on map), outside of the structure
- Furnace Creek in the area near where previous high mercury results were recorded in the 2005 Removal Assessment
- The Main Tailings Pile

See maps in Figures 1 and 2.

Temporal Study Boundaries

Analysis must be performed several weeks prior to snow fall this winter to complete the removal before weather interferes.

The Decision Rule

The following statements describe the decision rules to apply to this investigation:

- In the Old Furnace area, the soil in the area around the furnace structure will be excavated until sample analysis with XRF shows no mercury concentrations in surface soil remain above 23 mg/kg;
- In the New Furnace area, the soil outside the structures will be covered with clean fill where sample analysis with XRF shows no surface soil levels above 115 mg/kg mercury;
- In Furnace Creek, soil and sediment will be excavated until sample analysis shows no surface soil levels remain above 10 mg/kg mercury;
- In the Main Tailings Pile, soil will be resloped or covered everywhere sample analysis shows surface soil levels are above 10 mg/kg mercury;
- If mercury above 10 mg/kg is found in soil to be used as clean fill, the soil will not be used. Only soil confirmed to contain less than 10 mg/kg mercury will be used as clean material for capping.

Limits on Decision Error

The possibility exists that XRF detection limits will be higher than required to achieve accuracy at the sediment or soil action levels. In that situation the Lumex will be used for the analysis. If detection limits are still not achieved, the result will be more uncertainty about the area to clean up and more soil will be excavated or covered to account for the uncertainty.

Design Optimization

The XRF will be used in situ whenever possible to achieve accurate results. Reproducibility and accuracy of in situ XRF analyses will be checked by collecting, air drying, analyzing and comparing five in situ samples at the start of sampling. Where interferences are suspected, steps will be taken to eliminate the interferences by mechanisms such as drying, grinding or sieving the samples or analyzing them using the Lumex with soil attachment.

The Lumex will be calibrated using accepted calibration criteria and verified using a second source standard. XRF results will be periodically verified using the Lumex.

Sampling

All samples will be collected following applicable SOPs and methods. The XRF and Lumex for sediment will be calibrated before each day of use and checked with a second source standard. A field blank will be analyzed with each calibration to confirm the concentration of nondetection.

Sampling Pattern

Grab soil samples will be collected for surface soil in areas where previous studies indicate mercury contamination exists. The sample locations will be the width of the excavator bucket apart. After contaminated soil is excavated, the new surface will be reanalyzed and excavation will continue until the action level is reached.

Number of Samples
For this removal action, a total of approximately 500 samples are expected to be analyzed.

Types and Locations of Samples
Grab soil samples will be collected from each of the DAs at the frequency and locations that best delineate the extent of contamination. This will be determined in the field by the OSC. Each sample location will be noted by global positioning system (GPS) equipment and on a site map.

Sample Matrix and Target Analytes
Sediments, soils, and tailings/waste rock will be collected for total mercury analysis. For the purpose of this sampling event it will not be necessary to differentiate between these three matrix types. If particle size is too large for accurate analyses, the samples will be ground prior to analysis. if the sample contains too much moisture for accurate analyses, the sample will be decanted and air dried prior to analysis.

Sample collection and analysis information is summarized in Tables 1 through 4.

The Sample Plan Alteration Form (a blank form is included at the end of this document) will list project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work

Table 1
SAMPLE INFORMATION SUMMARY
Black Butte Mine
Lane County, Oregon

Project Sampling Schedule	Parameter/ Limits	Design Rationale	Sampling Design Assumptions	Sample Selection Procedures	Measurement Classification (Critical/Non Critical)	Nonstandard Method Validation
Soil and Sediment	Mercury / MDL	Determine if contaminant concentrations are greater than the action level for the DA.	Contaminant present.	At OSC direction	Critical	none

All samples will be collected during the field event.
The listed items are the decision areas.
Detection limits will be method or instrument limits for field methods.
Locations chosen based on indications from previous investigations at the site and from on-site observations.
All locations will be determined by the OSC.

Key:

Critical = Required to achieve project objectives or limits on decision errors.
XRF = X-Ray Fluorescence.
MDL = Method detection limits.

Table 2
Sample Analyses Summary
Black Butte Mine, Lane County Oregon

Matrix	Location	Analytical Parameters/Method	Sample Preservation	Technical Holding Time	Sample Containers
Soil	Main Tailings Pile, Old Furnace Area, New Furnace Area	Mercury / XRF instrument method and EPA Method 6200	None for In situ. Air dry for moist samples.	28 days	8 oz ziplock bag
Soil and Sediment	Furnace Creek	Mercury / Lumex with sediment attachment	None for In situ. Air dry for moist samples.	28 days	8 oz ziplock bag

Notes:
deg C = degrees Celsius
XRF = X-Ray Fluorescence
SOP = Standard Operating Procedure

Table 3

QC ANALYTICAL SUMMARY and FIELD ANALYTICAL METHODS

Black Butte Mine

Lane County, Oregon

Matrix	Parameter, Method	Method Description, and Detection Limit	Total Field Samples	QC Sample Analyses			Total Field Containers	Precision of Dup	Accuracy of MS
				Duplicate	Matrix Spike	Field Blank			
Soil and Sediment	Total Mercury, Lumex sediment	Thermal Combustion Atomic Fluorescence, 50 nanograms per kilogram	100	10%	10%	NA	100	35%	70%-130%
Soil and Sediment	Total Mercury, XRF	X-Ray Fluorescence, 10 mg/kg	400	10%	NA	NA	400	35%	NA

Notes:
Total number of field samples is estimated.
No extra volume is required for soil/sediment QC samples.
QC = Quality Assurance
XRF = X-Ray Fluorescence
Dup = Duplicate Sample

Table 4 SAMPLE CODING Black Butte Mine Lane County, Oregon		
Digits	**Description**	**Code Example**
1,2,3,4	Site ID	10EK – Black Butte Mine
5	Decision Area	1 – Main Tailing Pile 2 – New Furnace Area 3 – Old Furnace Area 4 – Furnace Creek
6,7,8	Consecutive Sample Number	001 – First sample of DA

Figure 1 Black Butte Mine Site Map

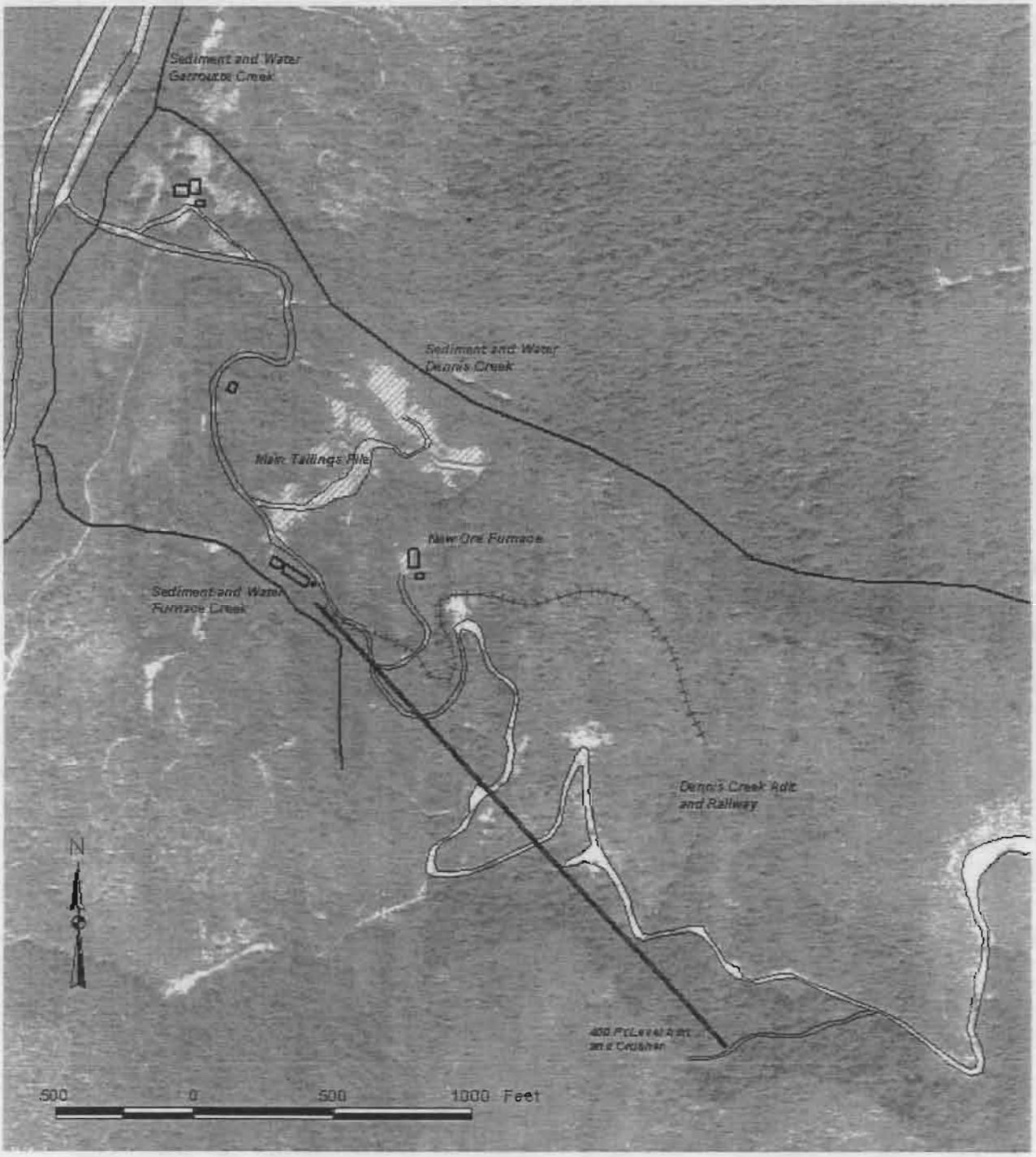
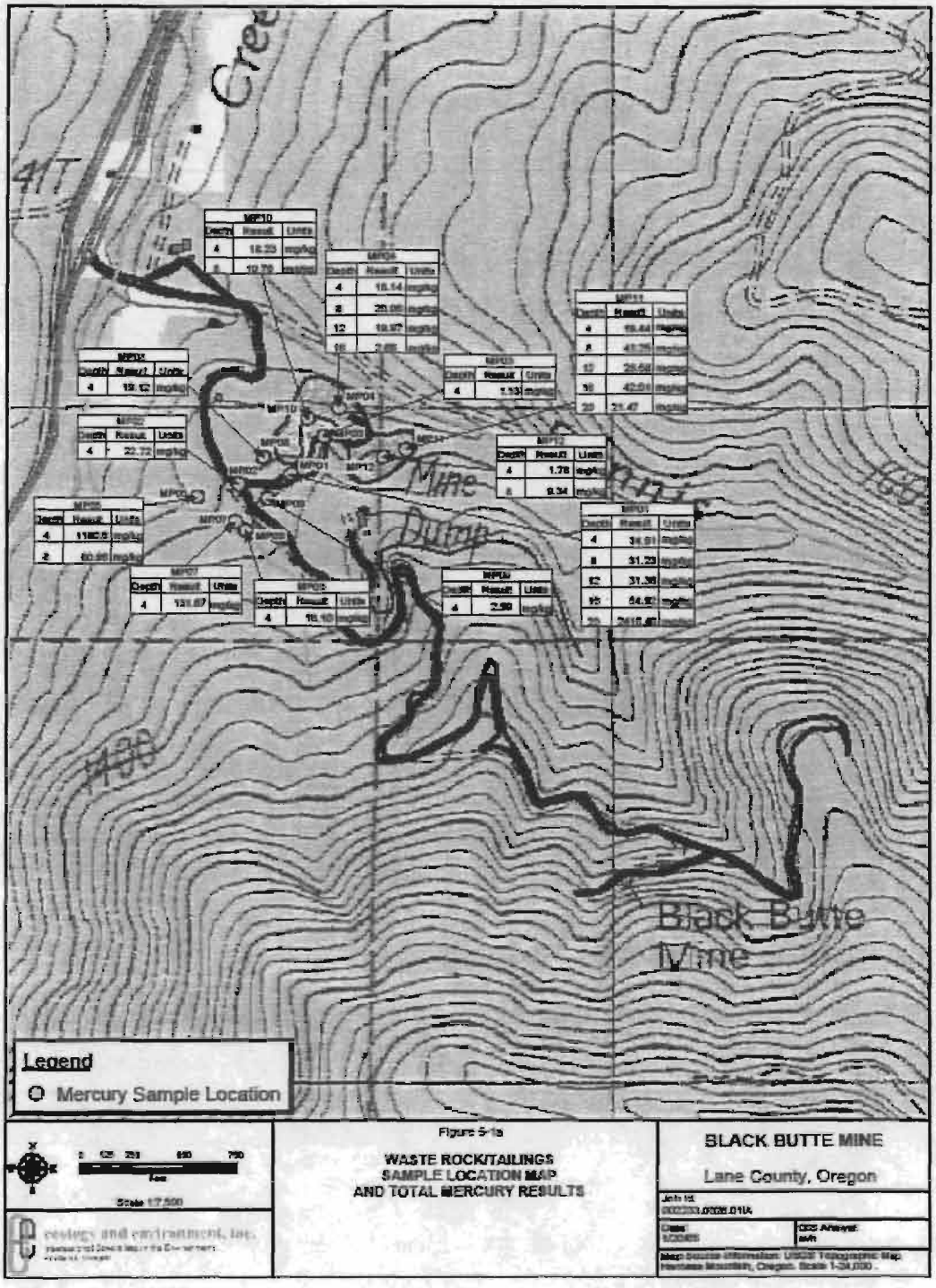


Figure 2 New Furnace Contamination Map



MEMORANDUM

DATE: November 6, 2007

TO: Erin Lynch, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington

SUBJ: **Mercury Field Analysis Data Quality Assurance Review, Black Butte Mine Site, Cottage Grove, Oregon**

REF: TDD: 06-04-0013 PAN: 002233.0088.01SF

The data quality assurance review of soil samples collected from the Black Butte Mine site in Cottage Grove, Oregon, has been completed. Mercury analyses (Lumex SOP) were performed by START personnel on-site.

Data Qualifications:

1. Sample Holding Times: Satisfactory.

The samples were maintained at temperatures less than or equal to 20°C after collection. Due to potential loss of volatile and/or metallic mercury, all mercury results are estimated (J or UJ) with an expected low bias (L) for positive results and an unknown bias (K) for non-detect results. The samples were analyzed within 24 hours of collection, therefore meeting QC criteria of less than 28 days between collection and analysis for mercury.

2. Initial and Continuing Calibration: Acceptable.

A minimum of three calibration standards and a blank were analyzed at the beginning of the analysis sequence and a minimum of one calibration standard and a blank were analyzed after every 20 samples and at the end of the sequence. The initial calibration correlation coefficients were > 0.995. Any results that exceeded the highest calibration standard were qualified as estimated quantities (J).

3. Blanks: Acceptable.

A calibration blank was analyzed for each 20 samples. There were no detections in any blanks that resulted in sample qualifications.

4. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All

results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

5. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

6. Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method, and, when applicable, the Office of Emergency and Remedial Response Publication "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the sample detection limits but greater than the instrument detection limits or because quality control criteria limits were not met.

K - Unknown bias.

L - Low bias.

UJ - The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met.